

# PROCEEDINGS

OFFICERS FOR 1914

OF THE

## AMERICAN SOCIETY

OF

# CIVIL ENGINEERS

(INSTITUTED 1852)

VOL. XL-No. 9

NOVEMBER, 1914

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NEW YORK 1914

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# American Society of Civil Engineers

## OFFICERS FOR 1914

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Term expires January, 1916:

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GARDNER S. WILLIAMS

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Treasurer, JOHN F. WALLACE

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1916:

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RICHARD MONTFORT

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ON MATERIALS FOR ROAD CONSTRUCTION: W. W. Crosby, A. W. Dean, H. K. Bishop, A. H. Blanchard, George W. Tillson, Nelson P. Lewis, Charles J. Tilden.

ON VALUATION OF PUBLIC UTILITIES: Frederic P. Stearns, Charles S. Churchill, Leonard Metcalf, William G. Raymond, Henry E. Riggs, Jonathan P. Snow, William J. Wilgus.

TO INVESTIGATE CONDITIONS OF EMPLOYMENT OF, AND COMPENSATION OF, CIVIL ENGINEERS: Nelson P. Lewis, S. L. F. Deyo, Dugald C. Jackson, William V. Judson, George W. Tillson, C. F. Loweth, John A. Bensel.

TO CODIFY PRESENT PRACTICE ON THE BEARING VALUE OF SOILS FOR FOUNDATIONS, ETC.: Robert A. Cummings, Edward C. Shankland, Edwin Duryea, Jr., James C. Meem, Walter J. Douglas, Samuel T. Wagner, Frank M. Kerr.

ON A NATIONAL WATER LAW: F. H. Newell, George G. Anderson, Charles W. Comstock, Clemens Herschel, W. C. Hoad, Robert E. Horton, John H. Lewis, Charles D. Marx, Gardner S. Williams.

ON FLOODS AND FLOOD PREVENTION: C. McD. Townsend, John A. Bensel, T. G. Dabney, C. E. Grunsky, Frank M. Kerr, Morris Knowles, J. B. Lippincott, Daniel W. Mead, John A. Ockerson, Arthur T. Safford, Charles Saville, F. L. Sellow.

TO REPORT ON STRESSES IN RAILROAD TRACK: A. N. Talbot, A. S. Baldwin, J. B. Berry, G. H. Bremner, John Brunner, W. J. Burton, Charles S. Churchill, W. C. Cushing, Robert W. Hunt, George W. Kittredge, C. G. E. Larsson, William McNab, G. J. Ray, F. E. Turneaure, J. E. Willoughby.

The House of the Society is open from 9 A. M. to 10 P. M. every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

HOUSE OF THE SOCIETY—220 WEST FIFTY-SEVENTH STREET, NEW YORK.

TELEPHONE NUMBER.....5913 Columbus.  
CABLE ADDRESS....."Ceas, New York."

\*Elected to fill the vacancy caused by the death of Emil Gerber, Director, on April 16th, 1914.

# AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

## PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed  
in its publications.

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### MINUTES OF MEETINGS

#### OF THE SOCIETY

**October 21st, 1914.**—The meeting was called to order at 8.30 P. M.; Vice-President J. Waldo Smith in the chair; Chas. Warren Hunt, Secretary; and present, also, 179 members and 39 guests.

A paper by Kenneth Allen, M. Am. Soc. C. E., entitled "The Clarification of Sewage by Fine Screens", was presented by the author and illustrated with lantern slides. The subject was discussed by Messrs. W. L. D'Olier, Rudolph Hering, Alexander Potter, and Emil Kuichling. The Secretary announced that he had received written communications on the subject, from Messrs. G. Bertram Kershaw, W. L. Stevenson, George C. Whipple, C. A. Jennings, G. Franze and — Schaefer, George W. Fuller, and J. X. Cohen, but, owing to lack of time, these were not presented.

The presentation of the paper by S. W. Bowen, M. Am. Soc. C. E., entitled "The Design and Construction of Four Reinforced Concrete Viaducts at Fort Worth, Texas", was postponed, on account of the lateness of the hour.

The Secretary announced the death of:

WILLIAM CRAWFORD, of Ottawa, Ont., Canada, elected Member November 7th, 1888; died January 27th, 1913.

Adjourned.

**November 4th, 1914.**—The meeting was called to order at 8.30 P. M.; Vice-President Gardner S. Williams in the chair; T. J. McMinn, Assistant Secretary, acting as Secretary; and present, also, 145 members and 18 guests.

The minutes of the meetings of September 16th and October 7th, 1914, were approved as printed in *Proceedings* for October, 1914.

A paper by E. L. Sayers and A. C. Polk, Members, Am. Soc. C. E., entitled "The Lock 12 Development of the Alabama Power Company, Coosa River, Alabama", was presented by Mr. Polk and illustrated with lantern slides. The paper was discussed by Messrs. R. D. Coombs, Hugh L. Cooper, Spencer Miller, and A. C. Polk. The Secretary announced the receipt of a communication on the subject from James H. Harlow, M. Am. Soc. C. E., but it was not presented on account of lack of time.

A paper by H. T. Cory, M. Am. Soc. C. E., entitled "Water Supply of the San Francisco-Oakland Metropolitan District", was presented by the Secretary, who announced the receipt of communications on the subject from Messrs. L. J. Le Conte and F. T. Robson, but these were not read on account of lack of time.

The Secretary announced the election of the following candidates on November 4th, 1914:

AS MEMBERS

CHARLES LUCIEN PILLSBURY, Minneapolis, Minn.

CHARLES WILBER ROOT, Ashland, Ore.

AS ASSOCIATE MEMBERS

JOHN MARTIN BANDEL, Baltimore, Md.

VAUGHN TAYLOR BORNET, Bala, Pa.

ROBERT MAX DE GARMO, Marathon, Fla.

ROBERT MAXIMILIAN FEUSTEL, Springfield, Ill.

DE GENNES FRASER, Gisborne, New Zealand

GEORGE BRADLEY GASCOIGNE, Cleveland, Ohio

ROYAL WILLIAM GELDER, Greeley, Colo.

CLARENCE JASPER GREEN, Salem, Ore.

FRANK TROWBRIDGE JAMES, Manila, Philippine Islands

JOHN CALVIN LITTLE, Baltimore, Md.



JAMES TALBOTT MADISON, San Francisco, Cal.  
THOMAS PEALER, Indiana, Pa.  
HENRY TYLER PIERCE, Monroe Bridge, Mass.  
GEORGE WESLEY PRACY, San Francisco, Cal.  
JOSEPH PAUL PRICE, Columbia, Mo.  
EWALD PYZEL, Santa Barbara, Cal.  
EDMUND ABIEL THORNTON, Ray, Ariz.  
HENRY ALFONSO TRUE, JR., Cheyenne, Wyo.  
PAUL ROBERT WATSON, San Diego, Cal.  
ERNEST CHARLES WEBSTER, Honolulu, Hawaii  
FRANKLIN LEMUEL WHITNEY, La Ceiba, Honduras  
CHARLES BENSON WIGTON, Boston, Mass.  
ROY HEATH WILSON, Miami, Fla.  
FRANCIS HERBERT WRIGHT, Chicago, Ill.  
JESSE BERNARD WRIGHT, Kingman, Ariz.

## AS ASSOCIATE

THOMAS LAFAYETTE ROSSER, JR., Earlham, Iowa

## AS JUNIORS

EDWARD PORTER ALEXANDER, Duluth, Minn.  
JOHN BAUER, JR., Mt. Vernon, Ohio  
ROBERT WESLEY BRIGGS, New York City  
WILLIAM EILERT DAVIS, Woodland, Cal.  
WILLIAM THOMAS HOGG, New Orleans, La.  
GEORGE WALLACE KABLE, State College, N. Mex.  
LOWELL GAYNOR KRIGBAUM, San Francisco, Cal.  
STANLEY MCCASSY, Dayton, Ohio  
HERMAN RICHARD MAIER, Brooklyn, N. Y.  
GEORGE EARL MARTIN, Lafayette, Ind.  
JAMES ROBBINS RANDOLPH, Blacksburg, Va.  
EDWARD KING SMITH, Beloit, Wis.  
EDWIN MILO STILES, Fort Shaw, Mont.  
RICHARD ELVIN JEWELL SUMMERS, Sioux City, Iowa  
ARTHUR FREDERICK BURGAN THOMPSON, London, England  
MINTON MACHADO WARREN, Boston, Mass.  
DAVID MOWAT WATSON, New York City  
DEE LELAND WILSON, Miami, Fla.

The Secretary announced the transfer of the following candidates on November 4th, 1914:

## FROM ASSOCIATE MEMBER TO MEMBER

SAMUEL DAVIS FOSTER, Harrisburg, Pa.  
GEORGE RUFUS JOHNSON, West Haven, Conn.  
RUFUS MASON WHITTET, Boston, Mass.

## FROM JUNIOR TO ASSOCIATE MEMBER

JOHN WILBUR CUNNINGHAM, Portland, Ore.  
 WILLIAM PATRICK FEELEY, Buffalo, N. Y.  
 JOHN HENRY GLANDER, Jr., Birmingham, Ala.  
 FERDINAND EUGENE HAYES, Jr., La Higuera, Coquimbo, Chili  
 OLIVER YEATON LEONARD, Pottstown, Pa.  
 LYNN ELWOOD PERRY, Greeneville, Tenn.  
 ARTHUR JOHNSON SACKETT, New York City  
 WALTER SHERMAN ST. JOHN, New York City  
 ROBERT LEE TATUM, Vicksburg, Miss.  
 WILLIAM TUFTS, Boston, Mass.  
 FERD CLARK WINTERMUTE, Wilkes-Barre, Pa.

The Secretary announced the following deaths:

BERNARD RICHARDSON GREEN, of Washington, D. C., elected Member, October 2d, 1889; died October 22d, 1914.

FREDERIC JOHN HENRY RICKON, of San Francisco, Cal., elected Member, January 4th, 1888; died October 7th, 1914.

Adjourned.

The Secretary announced the transfer of the following candidates on November 4th, 1914:

From Associate Member to Member

Samuel Davis Foster, Harrisburg, Pa.  
 George Rufus Jones, West Haven, Conn.  
 Rufus Marion Whittier, Boston, Mass.

## OF THE BOARD OF DIRECTION

(Abstract)

**November 4th, 1914.**—The Board met at 3.10 P. M., President McDonald in the chair; Chas. Warren Hunt, Secretary; and present, also, Messrs. Bush, Cummings, Edwards, Endicott, Haskell, Hodge, Keefer, Leonard, Loweth, Montfort, Smith, Thomson, Tuttle, and Williams.

Messrs. Hodge, Edwards, and Tuttle, who were appointed Tellers to canvass the Preliminary Suggestions for the Nominating Committee, reported the result of the canvass.

The Secretary was instructed to send out the result of this canvass, giving the three members receiving the highest number of votes in each District, and the number of votes received by each, together with another form for Final Suggestions. The canvassing of said Final Suggestions was fixed to take place January 15th, 1915, and the same Committee of Tellers was appointed to make the canvass.

The Constitution of the Northwestern Association of Members of the American Society of Civil Engineers, Minneapolis, Minn., was approved by the Board.

The President was requested to appoint a Committee to consider whether a Special Meeting of the Society shall be held at some point outside of New York City at some time between the date of the Annual Meeting and of the Annual Convention in San Francisco in September, 1915.

The resignations of one Associate Member and one Associate were accepted.

Ballots for membership were canvassed, resulting in the election of 2 Members, 25 Associate Members, 1 Associate, and 18 Juniors, and the transfer of 11 Juniors to the grade of Associate Member.

Three Associate Members were transferred to the grade of Member. Applications for membership were considered, and other routine business transacted.

Adjourned.

**ANNOUNCEMENTS**

The House of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

**FUTURE MEETINGS**

**December 2d, 1914.—8.30 P. M.**—This will be a regular business meeting. Two papers will be presented for discussion as follows: "The Differential Surge Tank," by Raymond D. Johnson, Esq.; and "Penstock and Surge-Tank Problems," by Minton M. Warren, Esq.

These papers were printed in *Proceedings* for October, 1914.

**December 16th, 1914.—8.30 P. M.**—At this meeting, two papers will be presented for discussion, as follows: "Submerged Pipe Work at Portland, Oregon", by D. D. Clarke, M. Am. Soc. C. E.; and "History of Little Rock Junction Railway Bridge of the St. Louis, Iron Mountain and Southern Railway Company, Over the Arkansas River, at Little Rock, Arkansas, 1883-1914", by C. E. Smith, M. Am. Soc. C. E.

These papers are printed in this number of *Proceedings*.

**ANNUAL MEETING**

The Sixty-second Annual Meeting will be held at the Society House, on Wednesday and Thursday, January 20th and 21st, 1915. The Business Meeting will be called to order at 10 o'clock on Wednesday morning. The Annual Reports will be presented, officers for the ensuing year elected, members of the Nominating Committee appointed, Reports of Special Committees presented for discussion, and other business transacted.

**SPECIAL MEETINGS**

Meetings, for discussion of the Report of the Special Committee on Materials for Road Construction, will be held at 10 A. M. and 2 P. M. on Friday, January 22d, 1915 (the day following the close of the Annual Meeting of the Society).

**SEARCHES IN THE LIBRARY**

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction, to the members who have made use of the resources of the Society in this manner, has been expressed frequently, and leaves little doubt that if it were generally known to the membership that such work would be undertaken, many would avail themselves of it.

The cost is trifling compared with the value of the time of an engineer who looks up such matters himself, and the work can be performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

In reference to this work the Appendices\* to the Annual Reports of the Board of Direction for the years ending December 31st, 1906, and December 31st, 1910, contain summaries of all searches made to date.

### PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings*.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be published as heretofore in *Proceedings*, and set down for presentation to a future meeting of the Society, and on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to be presented at meetings, but written discussions only will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

The Board of Direction has adopted rules for the preparation and presentation of papers, which will be found on page 429 of the August, 1913, *Proceedings*.

### LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

#### San Francisco Association

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 P. M., at

\* *Proceedings*, Vol. XXXIII, p. 20 (January, 1907); Vol. XXXVII, p. 28 (January, 1911).

the Palace Hotel, on the third Friday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 P. M. every Wednesday, and the place of meeting may be ascertained by communicating with the Secretary of the Association, E. T. Thurston, Jr., M. Am. Soc. C. E., 713 Mechanics' Institute, 57 Post Street.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest.

#### (Abstract of Minutes of Meeting)

**August 21st, 1914.**—The meeting was called to order; President Snyder in the chair; E. T. Thurston, Jr., Secretary; and present, also, 57 members and guests.

After some discussion, the Secretary was authorized to take such steps as may be necessary to increase and maintain the popularity of the weekly luncheons of the Association.

President Snyder announced that he had appointed Messrs. C. E. Grunsky, H. L. Haehl, and E. J. Schneider to assist the Board of Direction in the choice of suitable headquarters for the Society for the Annual Convention of 1915.

A paper entitled "East Contra Costa Irrigation Project", by A. Kempke, Jr., Assoc. M. Am. Soc. C. E., was presented by the author, who illustrated his remarks with stereopticon views. The subject was discussed briefly by some of the members present.

Adjourned.

#### Colorado Association

The meetings of the Colorado Association of Members of the American Society of Civil Engineers (Denver, Colo.) are held on the second Saturday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary, Roger W. Toll, Assoc. M. Am. Soc. C. E., 700 Tramway Building, Denver, Colo. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesdays, at 12.30 P. M., at the Colorado Electric Club.

Visiting members are urged to attend the meetings and luncheons.

#### Atlanta Association

The Atlanta Association of Members of the American Society of Civil Engineers was organized on March 14th, 1912. The Association holds its meetings at the University Club, Atlanta, Ga.

At the meeting of the Association on December 29th, 1913, the new Chairman, John Ruddle, M. Am. Soc. C. E., was installed, and Messrs. Park A. Dallis and G. R. Solomon were appointed members of the Executive Committee. T. P. Branch, Assoc. M. Am. Soc. C. E., was elected Secretary.



**Baltimore Association**

On May 6th, 1914, the Baltimore Association of Members of the American Society of Civil Engineers was organized, a Constitution adopted, and the following officers were elected: J. E. Greiner, President; Francis Lee Stuart, First Vice-President; L. H. Beach, Second Vice-President; Harry D. Williar, Jr., Secretary-Treasurer; and Messrs. H. D. Bush, B. T. Fendall, B. P. Harrison, Calvin W. Hendrick, Oscar F. Lackey, M. A. Long, and A. A. Thompson, Directors.

At its meeting of September 2d, 1914, the Board of Direction considered and approved the proposed Constitution of the Baltimore Association of Members of the American Society of Civil Engineers.

**Louisiana Association**

The Louisiana Association of Members of the American Society of Civil Engineers (New Orleans, La.) has been organized with the following officers: Frank M. Kerr, President; J. F. Coleman and W. B. Gregory, Vice-Presidents; A. M. N. Blamphin, Treasurer; and L. C. Datz, Secretary.

**Northwestern Association**

At its meeting of November 4th, 1914, the Board of Direction considered and approved the proposed Constitution of the Northwestern Association of Members of the American Society of Civil Engineers (St. Paul and Minneapolis, Minn.).

**Philadelphia Association**

On December 22d, 1913, the Philadelphia Association of Members of the American Society of Civil Engineers was organized, with the following officers: George S. Webster, President; Richard L. Humphrey and F. Herbert Snow, Vice-Presidents; John Sterling Deans, J. W. Ledoux, Edgar Marburg, and H. S. Smith, Directors; S. M. Swaab, Treasurer; and W. L. Stevenson, Secretary. The meetings of the Association will be held at the Engineers' Club of Philadelphia, 1317 Spruce Street.

**Portland, Ore., Association**

On June 18th, 1913, the Portland, Ore., Association of Members of the American Society of Civil Engineers was organized, with the following officers: E. G. Hopson, President; W. S. Turner, First Vice-President; D. D. Clarke, Second Vice-President; G. B. Hegardt, Treasurer; and Charles J. McGonigle, Secretary.

**(Abstract of Minutes of Meeting)**

**October 21st, 1914.**—The meeting was called to order at the Commercial Club; President Hopson in the chair; and Charles J. McGonigle, Secretary.

The minutes of the preceding meeting were read and approved.

A communication to the Secretary of State of Oregon, authorizing to add the name of the Association to the negative argument presented by the Portland Chamber of Commerce against a measure introduced to re-organize certain State offices, was read.

The Report of the Treasurer was read and accepted, and the following officers were elected: G. C. Mason, President, and J. T. Whistler, Second Vice-President.

A paper by John H. Lewis, Assoc. M. Am. Soc. C. E., entitled "State Engineer's Department and Its Relation to Development in Oregon," was presented by the author, and discussed.

On motion, Messrs. J. C. Stevens and C. J. McGonigle were appointed a Committee to publish Mr. Lewis' paper, but not at the expense of the Association.

A vote of thanks was tendered Mr. Lewis for his interesting paper.

Adjourned.

#### **St. Louis Association**

At its meeting of October 7th, 1914, the Board of Direction considered and approved the proposed Constitution of the St. Louis Association of Members of the American Society of Civil Engineers.

#### **Seattle Association**

At the Annual Meeting of the Association, held on January 26th, 1914, the following officers were elected for the ensuing year: Ernest B. Hussey, President; A. H. Fuller, Vice-President; and Carl H. Reeves, Secretary-Treasurer.

(Abstract of Minutes of Meetings)

**September 28th, 1914.**—The meeting was called to order at the College Club at 12.15 p. m.; Ernest B. Hussey, President, in the chair; Carl H. Reeves, Secretary; and present, also, 14 members and guests.

The minutes of the meeting of August 31st, 1914, were read and approved.

A discussion of President McDonald's Address before the Annual Convention of the Society, on June 2d, 1914, was presented by A. H. Fuller, M. Am. Soc. C. E., who was followed by Messrs. Powell, Fowler, Hall, and Hussey.

The President explained the absence of Messrs. Ralston and Dimock who, with Mr. Fuller, had been appointed to open the discussion.

On motion, the discussion was continued to the October meeting, and Messrs. Ralston and Dimock were invited to present their views on the subject at that meeting.

Adjourned.

**October 26th, 1914.**—The meeting was called to order at 12.15 P. M., at the College Club; President Hussey in the chair; Carl H. Reeves, Secretary; and present, also, 20 members and guests.

The minutes of the meeting of September 28th, 1914, were read and approved.

The Secretary called the attention of the members to the pamphlet on water laws issued by the Washington Water Code Commission.

The bill, drawn up by the Engineers' Commission of Pennsylvania, for licensing engineers, was presented by topics.

A letter from the Western Society of Engineers asking whether the Association was contemplating the possibility of licensing or registering engineers, was read, and the Secretary was instructed to reply and state the conditions. On motion, duly seconded, it was ordered that the subject of the licensing of engineers be given special consideration at the next regular meeting of the Association.

On motion, duly seconded, it was ordered that the November meeting be held in the evening; that the members of the Alaska Railway Commission be invited to be present at that meeting; and that the President be authorized to appoint a committee of arrangements therefor.

In accordance with the action of the September meeting, the continuation of the discussion of President McDonald's Address at the Annual Convention of the Society, was opened by A. H. Dimock, M. Am. Soc. C. E., who was followed by others present.

The Secretary called the attention of the Association to the question of the federation of the engineering societies in Seattle, and, on motion, duly seconded, it was decided to invite all members of the various engineering societies of the city to attend the meeting of November 30th, 1914, in order that the matter might be given preliminary consideration and any necessary committees appointed.

The President appointed Messrs. R. H. Ober, Chairman; A. H. Dimock, A. S. Downey, A. H. Fuller, and Joseph Jacobs, a Committee of Arrangements for the meeting of November 30th, 1914.

Adjourned.

#### **Southern California Association**

The Southern California Association of Members of the American Society of Civil Engineers (Los Angeles, Cal.) holds regular bi-monthly meetings, with banquet, on the second Wednesday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 P. M. every Wednesday, and the place of meeting may be ascertained from the Secretary of the Association, W. K. Barnard, M. Am. Soc. C. E., 515 Central Building, Los Angeles, Cal.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in Los Angeles, and any such member will be gladly welcomed as a guest at any of the meetings or luncheons.

#### **Spokane Association**

At its meeting of March 4th, 1914, the Board of Direction considered and approved the proposed Constitution of the Spokane Association of Members of the American Society of Civil Engineers.

The following officers have been elected: President, C. S. MacCalla; Vice-President, U. B. Hough; Second Vice-President, Morton Macartney; Secretary-Treasurer, A. D. Butler.

#### **Texas Association**

At its meeting of December 31st, 1913, the Board of Direction considered and approved the proposed Constitution of the Texas Association of Members of the American Society of Civil Engineers. The headquarters of the Association is Dallas, Tex.

The following officers have been elected: President, J. C. Nagle; First Vice-President, John B. Hawley; Second Vice-President, C. H. Chamberlin; Secretary-Treasurer, J. F. Witt; First Director, J. M. Howe; and Second Director, Terrell Bartlett.

**(Abstract of Minutes of Meetings)**

**May, 1914.**—The meetings were called to order at Austin, Tex.; President Nagle in the chair; J. F. Witt, Secretary; and present, also, 22 members and 14 guests.

Instead of a formal Inaugural Address, President Nagle outlined the Bill Governing the State Board of Water Engineers and the work of the Board.

A paper by John B. Hawley, M. Am. Soc. C. E., entitled "Retempered Portland Cement Mortar," was presented by the author.

Messrs. C. H. Chamberlin and R. C. Gowdy, Members, Am. Soc. C. E., discussed the "Federal Bill on Public Carriers' Valuation"; and J. M. Howe, M. Am. Soc. C. E., addressed the meeting on "Needed Legislation".

Adjourned.

**MINUTES OF MEETINGS OF SPECIAL COMMITTEES****Conditions of Employment of, and Compensation of, Civil Engineers**

**November 5th, 1914.**—A meeting of the Special Committee to Investigate the Conditions of Employment of, and Compensation of, Civil Engineers, was held at the House of the Society, the members of the Committee present being S. L. F. Deyo, C. F. Loweth, William V. Judson, and Nelson P. Lewis, Chairman.

The Committee examined the charts which have been prepared showing the results of the replies to the second circular letter of inquiry, and discussed at length the plan and scope of its report.

The Committee also discussed plans for the collection of additional data relating to engineers who are not members of the Society, and for information relative to the time during which engineers are out of employment.

The Committee adjourned to meet at the call of the Chair.

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Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms, and at all meetings:

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**Associação dos Engenheiros Cíveis Portuguezes**, Lisbon, Portugal.

- Australasian Institute of Mining Engineers**, Melbourne, Victoria, Australia.
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- Brooklyn Engineers' Club**, 117 Remsen Street, Brooklyn, N. Y.
- Canadian Society of Civil Engineers**, 413 Dorchester Street, West, Montreal, Que., Canada.
- Civil Engineers' Society of St. Paul**, St. Paul, Minn.
- Cleveland Engineering Society**, Chamber of Commerce Building, Cleveland, Ohio.
- Cleveland Institute of Engineers**, Middlesbrough, England.
- Dansk Ingeniorforening**, Amaliegade 38, Copenhagen, Denmark.
- Detroit Engineering Society**, 46 Grand River Avenue, West, Detroit, Mich.
- Engineers and Architects Club of Louisville**, 1412 Starks Building, Louisville, Ky.
- Engineers' Club of Baltimore**, Baltimore, Md.
- Engineers' Club of Minneapolis**, 17 South Sixth Street, Minneapolis, Minn.
- Engineers' Club of Philadelphia**, 1317 Spruce Street, Philadelphia, Pa.
- Engineers' Club of St. Louis**, 3817 Olive Street, St. Louis, Mo.
- Engineers' Club of Toronto**, 96 King Street, West, Toronto, Ont., Canada.
- Engineers' Society of Northeastern Pennsylvania**, 415 Washington Avenue, Scranton, Pa.
- Engineers' Society of Pennsylvania**, 31 South Front Street, Harrisburg, Pa.
- Engineers' Society of Western Pennsylvania**, 2511 Oliver Building, Pittsburgh, Pa.
- Institute of Marine Engineers**, 58 Romford Road, Stratford, London, E., England.
- Institution of Engineers of the River Plate**, Calle 25 de Mayo 195, Buenos Aires, Argentine Republic.
- Institution of Naval Architects**, 5 Adelphi Terrace, London, W. C., England.
- Junior Institution of Engineers**, 39 Victoria Street, Westminster, S. W., London, England.
- Koninklijk Instituut van Ingenieurs**, The Hague, The Netherlands.
- Louisiana Engineering Society**, State Museum Building, Chartres and St. Ann Streets, New Orleans, La.
- Memphis Engineering Society**, Memphis, Tenn.
- Midland Institute of Mining, Civil and Mechanical Engineers**, Sheffield, England.



- Montana Society of Engineers, Butte, Mont.**  
**North of England Institute of Mining and Mechanical Engineers,**  
 Newcastle-upon-Tyne, England.  
**Oesterreichischer Ingenieur- und Architekten-Verein, Eschen-**  
 bachgasse 9, Vienna, Austria.  
**Oregon Society of Civil Engineers, Portland, Ore.**  
**Pacific Northwest Society of Engineers, 803 Central Building, Seat-**  
 tle, Wash.  
**Rochester Engineering Society, Rochester, N. Y.**  
**Sachsischer Ingenieur- und Architekten-Verein, Dresden, Germany.**  
**Sociedad Colombiana de Ingenieros, Bogota, Colombia.**  
**Sociedad de Ingenieros del Peru, Lima, Peru.**  
**Societe des Ingenieurs Civils de France, 19 rue Blanche, Paris,**  
 France.  
**Society of Engineers, 17 Victoria Street, Westminster, S. W.,**  
 London, England.  
**Svenska Teknologforeningen, Brunkebergstorg 18, Stockholm,**  
 Sweden.  
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**Western Society of Engineers, 1737 Monadnock Block, Chicago, Ill.**



**ACCESSIONS TO THE LIBRARY**

(From October 7th to November 2d, 1914)

**DONATIONS\*****VALUATION OF PUBLIC SERVICE CORPORATIONS:**

Legal and Economic Phases of Valuation for Rate Making and Public Purchase: Supplement. By Robert H. Whitten. Buckram, 9½ x 6 in., 27 pp. + pp. 799-1443. New York, The Banks Law Publishing Co., 1914. \$5.50.

The theory and practice of valuation have developed rapidly, it is stated, since the author's work on "Valuation of Public Service Corporations," was issued in 1912. In the present supplemental volume, the author, it is said, has developed further his statement of the legal and economic principles of valuation, and has included the numerous Court and commission decisions on the subject, made since that time, thus bringing the work up to date. The new matter and decisions are, it is stated, arranged, discussed, and fully quoted or abstracted in a manner similar to those in the previous volume, and as the same chapter headings are retained and a consolidated index included, the two volumes, it is said, may be used as an enlarged and revised edition. The Chapter headings are: Purpose of Valuation; Fair Value for Rate Purposes; Market Value and Earning Power as Related to Fair Value for Rate Purposes; Cost of Reproduction as an Element in Fair Value for Rate Purposes; Actual Cost as an Element in Fair Value for Rate Purposes; Valuation of Land; Pavement Over Mains; Property Donated or Acquired Without Cost; Property Constructed Out of Surplus; Unused Property; Unit Prices; Average Price *v.* Present Price; Overhead Charges; Discount on Bonds; Working Capital; Piecemeal Construction; Adaptation and Solidification; Physical Depreciation; Cost-New *v.* Cost-Less-Depreciation; Functional Depreciation; Annual Depreciation Allowance; Going Concern in Purchase Cases; Going Concern in Rate Cases; Treatment of Going Value by the Wisconsin Commission; Franchise Value in Purchase Cases; Franchise Value in Rate Cases; Appraisal of Franchise Value; Return on Investment; Contract, Water Power, and Patent Rights; Tables of Cases Cited; Index.

**STEEL CONSTRUCTION:**

A Text and Reference Book Covering the Design of Steel Framework for Buildings. By Henry Jackson Burt, M. Am. Soc. C. E. Morocco, 7 x 4½ in., illus., 372 + 9 pp. Chicago, American Technical Society, 1914. (Donated by the Publisher and the Author.)

As discussed in this book this subject is stated to cover the use of structural steel for the supports of buildings, both in the form of isolated members or complete framework. The subject-matter deals, it is said, especially with architectural structures, such as business buildings, office buildings, warehouses, residences, etc., mill buildings and roof trusses being omitted. For the student, facts and formulas, with explanations of their underlying principles and practical illustrations of their proper applications in current practice, are given. For use as a reference book by designers, the author, it is stated, has brought together all the necessary data for the complete design of structural steelwork for business buildings, as well as examples and illustrations of problems encountered in such practice. A complete set of drawings and detailed explanations for a sixteen-story fireproof hotel is also included for those who are interested in the design of structural steelwork. The Contents are: Introduction; Method of Manufacture; Steel Sections—Adaptability and Use; Quality of Material; Unit Stresses; Rivets and Bolts; Beams; Riveted Girders; Compression Members—Columns; Tension Members; Wind Bracing; Practical Design—A Sixteen-story Fireproof Hotel; Protection of Steel; Specifications; Index.

**MECHANICS OF MATERIALS.**

By Mansfield Merriman, M. Am. Soc. C. E. Eleventh Edition. Cloth, 8½ x 5½ in., illus., 11 + 524 pp. New York, John Wiley & Sons, Inc.; London, Chapman & Hall, Limited, 1914. \$4.00.

The first edition of this book was issued in 1885. In the meantime many advances have been made in the subject of the Mechanics of Materials, and in order to record and correlate them properly, the author states that it has been necessary to rewrite and reset the book. In so doing, he has endeavored, it is said, to keep the facts of experiment and practice relating to the subject constantly in view, and

\* Unless otherwise specified, books in this list have been donated by the publishers.

to present them more clearly and logically, in order to advance the interests of sound engineering education and to promote sound engineering practice. The same general plan of treatment has been followed in this edition, except that a somewhat different arrangement of subdivisions has been made and most of the topics have been treated in a more extended manner. The statement of averages of the principal materials of engineering has proved so advantageous to students, it is said, that it is followed in this edition. Many numerical examples relating to cases that arise in practice are given in the text to illustrate the formulas and methods used, and one or more problems are given at the end of each article for the student to solve. Such subjects as impact on bars and beams, resilience and work, and apparent and true stresses, have been much changed, it is said, in order to present them more clearly and accurately, and many new topics such as economic sections for beams, moving loads on beams, etc., and an entirely new chapter on the testing of materials, have been added. The Contents are: Elastic and Ultimate Strength; Elastic and Ultimate Deformation; Materials of Engineering; Cases of Simple Stress; General Theory of Beams; Simple and Cantilever Beams; Overhanging and Fixed Beams; Continuous Beams; Columns or Struts; Torsion of Shafts; Apparent Combined Stresses; Compound Columns and Beams; Resilience and Work; Impact and Fatigue; True Internal Stresses; Guns and Thick Cylinders; Rollers, Plates, Spheres; Miscellaneous Discussions; Mathematical Theory of Elasticity, Testing of Materials; Appendix; Tables; Index.

#### THE PRINCIPLES OF IRRIGATION PRACTICE.

By John A. Wiltsoe. (Rural Text-Book Series.) Cloth,  $7\frac{1}{2} \times 5\frac{1}{2}$  in., illus., 26 + 496 pp. New York, The Macmillan Company; London, Macmillan & Co., Ltd., 1914. \$1.75.

Much has been written, the preface states, about irrigation for the engineer, but little for the farmer. The aim of this book, it is said, has been to develop the principles of modern irrigation practice and the correct use of water by the farmer. The beginner in irrigation work having been kept in mind, simple language has been used and unnecessary technical terms have been omitted. The book, it is said, is essentially a manual for those who desire to master the natural laws involved in irrigation farming, and therefore the author has discussed in detail the relation of water to soil and to plants, the effect of irrigation on crops of various kinds, and the practical methods used in the growing of such crops. At the end of each chapter a short list of references to the subject discussed in that chapter, is given, and Appendix C contains a short bibliography of American irrigation practice. The Chapter headings are: The Meaning of Irrigation; Soil Moisture; The Soil as Water Reservoir; Saving Water by Cultivation; Soil Changes Due to Irrigation Water; Conditions Determining the Use of Soil Moisture by Plants; The Water-Cost of Dry Matter; Crop Development Under Irrigation; The Time of Irrigation; The Method of Irrigation; Crop Composition; The Use of the Rainfall; Irrigation of Cereals; Alfalfa and Other Forage Crops and Pastures; Sugar Beets, Potatoes, and Miscellaneous Crops; Fruit Trees, Other Trees and Shrubs; The Duty, Measurement and Division of Water; Over-Irrigation and Alkali; Irrigation in Humid Climates; Irrigation Tools and Devices; The History of Irrigation; Permanent Agriculture Under Irrigation; Appendix A, Water Constants; Appendix B, Discharge over Cippoletti's Weir; Appendix C, List of American Books on Irrigation; Index.

#### PLANE SURVEYING

For Use in the Classroom and Field. By William G. Raymond, M. Am. Soc. C. E. Leather,  $7\frac{1}{2} \times 5\frac{1}{2}$  in., illus., 589 pp. New York, Cincinnati, and Chicago, American Book Company, 1914. \$3.00. (Donated by the Publishers and the Author.)

In this book the author states that he has attempted to explain all the principles of surveying and to give examples which will enable the student to understand not only the possibilities, but also the limitations, of instruments and methods used in such work. The first edition of the book was published eighteen years ago, and when a revision was proposed it was decided, it is stated, to issue the new edition in pocket-book form. The subject-matter, it is said, has been rewritten, parts of it having been re-arranged for greater convenience in use, errors have been corrected, and the number of examples and exercises has been increased and inserted in the articles which they are intended to illustrate. The description of the adjustment of instruments has been rewritten, and the author believes that the collimation adjustment of the transit is explained correctly for the first time in a textbook. Crockett's logarithmic tables are, in the author's judgment, the best for the surveyor's use, and the form adopted for the first edition of this book has been slightly modified to increase their usefulness and are again used in this, the second, edition. The Chapter headings are: Introduction; Measurement of Level and Horizontal Lines; Vernier and Level Bubble; Measuring Differences of Altitude, or Leveling; Determination of Direction and Measurement of Angles; Land Survey Computations; Some

Surveying Problems; Special Office Instruments; Stadia Measurements; Meridian, Latitude, and Time; General Surveying Methods; Curves; Topographic Surveying; Earthwork Computations; City Surveying; Hydrographic Surveying; Mine Surveying; Appendix; Index.

#### MODERN TUNNELING

With Special Reference to Mine and Water-Supply Tunnels. By David W. Brunton and John A. Davis. Cloth,  $9\frac{1}{4} \times 6$  in., illus., 6 + 450 pp. New York, John Wiley & Sons; London, Chapman & Hall, Limited, 1914. \$3.50.

The Introduction states that this book is confined chiefly to tunnels and drifts for mining purposes, such as drainage, transportation, and development. Tunnels for carrying water for power, irrigation, and domestic use, in which the essential features are practically identical with those of mine tunnels, are also included. Descriptions and detailed cost data of modern methods and equipment used in mine tunneling, which have proved to be safe, efficient, and economical are given, as well as suggestions for and means of preserving the lives and health of employees engaged in such work, data relating to the choice and efficiency of equipment, and analyses of methods and costs, all of which the authors hope will result in a saving of life, energy, and capital. There is also a selected bibliography of tunneling and related subjects, arranged, by topics, in chronological order. The Chapter headings are: Introduction; The History of Tunneling; Modern Mining and Water Tunnels; Choice of Power for Tunnel Work; Air Compressors; Ventilation; Incidental Surface Equipment; Rock Drilling Machines; Haulage; Incidental Underground Equipment; Drilling Methods; Blasting; Methods of Mucking; Timbering; Safety; Cost of Tunnel Work; Bibliography; Appendix: Outline of Tunnel Data; Index.

#### STRUCTURAL ENGINEERS' HANDBOOK:

Data for the Design and Construction of Steel Bridges and Buildings. By Milo S. Ketchum, M. Am. Soc. C. E. Morocco,  $9\frac{1}{4} \times 6$  in., illus., 15 + 896 pp. New York and London, McGraw-Hill Book Company, Inc., 1914. \$5.00. (Donated by the Publishers and the Author.)

This book, the preface states, is intended as a working manual for the structural engineer, the student or engineer who has had a thorough course in applied mechanics and the calculation of stresses in structures, and the draftsman. The subject-matter covers, it is said, data, details, and tables for the design and construction of steel bridges and buildings, as well as standard specifications for materials and workmanship. Examples of structures which illustrate standard practice are included, and most of the drawings of their details are stated to have been prepared from actual working plans. The tables, it is said, have also been carefully calculated and checked. The book has been divided into two parts, Part I being limited to steel bridges and buildings, and other simple steel structures, no reference being made to swing or movable bridges, cantilever and suspension bridges. The first eleven chapters are devoted to a discussion of the various types of structures and the last six include design, estimates, calculation of stresses, materials, methods, equipment, and costs of shop work and erection. Part II contains tables for structural design and includes tables giving the properties of rolled sections, properties of built-up sections for chords, columns, struts, plate girders, etc., and data for standard structural details. In the calculation of the tables, only such sections as comply with standard specifications are said to have been included. The Contents are: Part I, Data and Details for the Design and Construction of Steel Bridges and Buildings: Steel Roof Trusses and Mill Buildings; Steel Office Buildings; Steel Highway Bridges; Steel Railway Bridges; Retaining Walls; Bridge Abutments and Piers; Timber Bridges and Trestles; Steel Bins; Steel Grain Elevators; Steel Head Frames and Coal Tipples; Steel Stand-Pipes and Elevated Tanks or Towers; Structural Drafting; Estimates of Structural Steel; Erection of Structural Steel; Engineering Materials; Structural Mechanics; The Design of Steel Details. Part II, Structural Tables; Index.

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### BY PURCHASE

**The Miners' Pocket-Book:** A Reference Book for Engineers and Others Engaged in Metalliferous Mining. By C. G. Warnford-Lock. Fifth Edition, Entirely Rewritten. New York and London, 1908.

**Greater Erie:** Plans and Reports for the Extension and Improvement of the City. Prepared for the City Planning Committee of the Chamber of Commerce and the Board of Trade, by John Nolen. 1913.

**A Treatise on the Differential Calculus** with Numerous Examples. By I. Todhunter. London, 1911.

**A Treatise on the Integral Calculus** and Its Applications, with Numerous Examples. By I. Todhunter. London, 1911.

**The Cleaning of Blast-Furnace Gases.** By Frederick H. Wagner. New York and London, 1914.

**Air Compression and Transmission.** By H. J. Thorkelson. New York and London, 1913.

**The Examination and Thermal Value of Fuel:** Gaseous, Liquid and Solid. By J. H. Coste and E. R. Andrews. Philadelphia and London, 1914.

**Roberts-Austen: A Record of His Work;** Being a Selection of the Addresses and Metallurgical Papers, Together with an Account of the Researches of Sir William Chandler Roberts-Austen. Compiled and Edited by Sydney W. Smith. Philadelphia and London, 1914.

**Stahl und Eisen Zeitschriftenschau;** Jahrgang, 1913. Düsseldorf, 1914.

**Strength of Materials.** By H. E. Murdock. Second Edition, Revised and Enlarged. New York and London, 1914.

**Illinois Water Supply Association:** Proceedings of the Third, Fourth, Fifth, and Sixth Meetings, Held at the University of Illinois. 4 Vol. Urbana-Champaign, Ill., 1911-14.

**Civic Bibliography for Greater New York.** Edited by James Bronson Reynolds for the New York Research Council. New York, 1911.

**Financing an Enterprise:** A Manual of Information and Suggestion for Promoters, Investors and Business Men Generally. By Francis Cooper. Third Edition. 2 Vol. New York, 1909.



**Neuzeitliche Wasserversorgung** in Gegenden Starker Bevölkerungs-Anhäufung in Deutschland: Eine Wirtschaftlich-Technische Untersuchung. Von A. Heilmann. München und Berlin, 1914.

**Aus Theorie und Praxis des Riementriebes** mit besonderer Berücksichtigung der Riementriebe Boesner: Ein Handbuch zum Gebrauch beim Entwerfen von Treibriemenanlagen für Maschinen-Ingenieure, Betriebsleiter, Fabrikanten und Studierende. Von Fritz Adolf Boesner. Berlin, 1914.

**Leading American Men of Science.** Edited by David Starr Jordan. New York, 1910.

**The System of Mineralogy** of James Dwight Dana, 1837-1868: Descriptive Mineralogy, Sixth Edition. By Edward Salisbury Dana. Rewritten and Enlarged. New York and London, 1914.

**A Treatise on Rocks, Rock-Weathering and Soils.** By George P. Merrill. New York and London, 1913.

**Elementary Geology.** By Ralph S. Tarr. New York and London, 1910.

**Forschungsarbeiten auf dem Gebiete des Ingenieurwesens.** Herausgegeben vom Verein Deutscher Ingenieure. Hefte 161-164. 3 Vol. Berlin, 1914.

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(From October 7th to November 2d, 1914)

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PATTERSON, ROBERT YOUNGMAN. Prin. Asst. Engr., Gulf, Fla. & Ala. Ry., Pensacola, Fla.....	Assoc. M.	Jan. 8,	1908
	M.	Oct. 7,	1914
SHIPLEY, HENRY FRANKLIN. Prin. Asst. Engr., in Chg., Highway Div., Eng. Dept., City of Cincinnati, 2605 Union Central Bldg., Cincinnati, Ohio.....		Oct. 7,	1914
WARD, HAROLD MANDEVILLE. Chf. Engr., Designing Dept., Milliken Bros., Inc., 20 Hazelwood Rd., Bloomfield, N. J.....		Oct. 7,	1914

## ASSOCIATE MEMBERS

ABRAHAM, PERCY LYONS. Care, Jamaica Govt. Ry., Kingston, Jamaica.....	Sept. 2,	1914
ANTHONY, HORACE FRANCIS. Asst. Engr., Water Supply Comm. of Pennsylvania, Telegraph Bldg., Harrisburg, Pa.....	May 6,	1914

## ASSOCIATE MEMBERS (Continued)

		Date of Membership.
ASHTON, DAVID HAWLEY. With Utah Constr. Co., 1104 East 2d South St., Salt Lake City, Utah.....		Sept. 2, 1914
AYER, JOHN. Designing Draftsman with the Directors of the Port of Boston, 11 Boylston Terrace, West Medford, Mass.....		Oct. 7, 1914
BELLOWS, SIDNEY RAYMOND. Asst. Engr., Barge Canal Terminals, New York Dept. of State Engr. and Surv., 17 Bat- tery Pl., Room 1219, New York City...	Jun.     Oct. 1, 1907 Assoc. M. Sept. 2, 1914	
BERG, JOHN. Draftsman, Ralph Modjeski, 704 North Lotus Ave., Chicago, Ill.....		Oct. 7, 1914
BUSHELL, ARTHUR WILLIAM. 135 Edwards St., New Haven, Conn.....	Jun.     Oct. 1, 1907 Assoc. M. Oct. 7, 1914	
COOLEY, ORRIN FULTON. Deputy County Surv., 716 Town- send St., Hollywood, Los Angeles, Cal.....		June 24, 1914
DAVIS, ROLAND PARKER. Bridge Engr., West Virginia State Road Bureau; Prof. of Structural and Hydr. Eng., West Vir- ginia Univ., 4 Ash St., Morgantown, W. Va.....	Jun.     Mar. 1, 1910 Assoc. M. Oct. 7, 1914	
ELLETT, TAZEWELL, JR. Res. Engr., B. & O. R. R., P. O. Box 14, Magnolia, W. Va.....		Oct. 7, 1914
FOWLER, JAMES DUNCAN. Engr. in Chg. of Constr., Worley & Black, 301 Reliance Bldg., Kansas City, Mo.....		Oct. 7, 1914
FRIELINGS DORF, HUGO AUGUST. Vice-Pres.; Mgr. of Eng. and Estimating Dept., Banner Iron Works, 4560 Shaw Ave., St. Louis, Mo.....		Oct. 7, 1914
HANNAN, DAVID EDWARD. 14230 Euclid Ave., Cleveland, Ohio.....		Oct. 7, 1914
HOFFMANN, ALFRED WILLY. Asst. Engr., Condron Co., 1215 Monadnock Blk., Chicago, Ill.....		Oct. 7, 1914
HOSKINS, JOHN KURTZ. San Engr., U. S. Public Health Service, 3d and Kilgour Sts., Cincinnati, Ohio.....		Oct. 7, 1914
HUDSON, OSCAR ALVIN. Asst. Engr., City Water Power Co. of Hartford, Conn., Austin, Tex.....		Oct. 7, 1914
KIMBLE, HOWARD. Asst. Engr., U. S. Geological Survey, Kapiolani Bldg., Honolulu, Hawaii.....		Oct. 7, 1914
KRIEGSMAN, EUGEN FREDERICK. Prof. of Eng., St. Ignatius Univ.; Designing and Const. Engr., 444 Market St., San Fran- cisco, Cal.....	Jun.     May 5, 1908 Assoc. M. Sept. 2, 1914	
LATSHAW, CHARLES ARTHUR. Chf. Engr., Dept. of Public Service, 823 Leonard St., Fostoria, Ohio.....		Oct. 7, 1914
LEWIS, OTIS FURMAN. Schuylerville, N. Y.....		Oct. 7, 1914
LINTON, THOMAS EDWIN. 2615 Cleveland Ave., Kansas City, Mo.....		Oct. 7, 1914

ASSOCIATE MEMBERS (Continued)		Date of Membership.
MARTIN, LEWIS M. Dist. Engr., Iowa State Highway Comm., Atlantic, Iowa		Oct. 7, 1914
MEGRAW, WILLIAM ADAMS. Office Engr., Baltimore Sewerage Comm., 1625 Eutaw Pl., Baltimore, Md.		Oct. 7, 1914
MILLS, MARION ELBERT. 927 South Ewing Ave., Dallas, Tex.		Oct. 7, 1914
MOOMAW, DALTON. Deputy County Surv. and Rd. Engr., Cuyahoga County, 1315 Lakeview Rd., N. E., Cleveland, Ohio		Oct. 7, 1914
MURPHY, EDWARD THEOBALD. U. S. Junior Engr., U. S. Engr. Office, Pigeon Cove, Mass.		Sept. 2, 1914
OLSEN, OLE KJELD. Contr. Engr., 823 Perdido St., New Orleans, La.		Oct. 7, 1914
OWEN, KENNETH DUNHAM. Montclair, N. J.	Jun.	Feb. 6, 1906
	Assoc. M.	April 1, 1914
PILLET, FREDERICK FISCHER. City Engr., City Hall, Wilmington, N. C.	Jun.	June 2, 1903
	Assoc. M.	Oct. 7, 1914
SHEERWOOD, NIAL. Monroe Bridge, Mass.		May 6, 1914
SMITH, CLAIRE HOWLAND WALLACE. Supt., Trinchera Irrig. Dist., Blanca, Colo.	Jun.	Dec. 5, 1911
	Assoc. M.	Oct. 7, 1914
SMITH, FRANCIS NOBLE. Res. Engr. of Constr., C. N. P. Ry., Henningville, B. C., Canada		Oct. 7, 1914
SPINKS, JOHN DAVIDSON. Albemarle, N. C.		Oct. 7, 1914
STARK, JOHN VASSAR. 1011 Tiffany St., New York City.		Oct. 7, 1914
STOBO, JOHN BRUCE. Asst. Engr., Corps of Engrs., State of New York, Box 61, Medina, N. Y.		Oct. 7, 1914
TORPEN, ALEX MAGNUS. 369 First St., San Francisco, Cal.		Oct. 7, 1914
TURNER, DOUGLAS BARLOW. Estimator and Designer, St. Louis Plant, Am. Bridge Co., 3953 Westminster Pl., St. Louis, Mo.		Sept. 2, 1914
VAIL, EPHRAIM MARTIN. Acting State Highway Engr., 303 East 6th St., Plainfield, N. J.		Sept. 2, 1914
VAN RENNELAER, ALLEN. P. O. Box 1359, Victoria, B. C., Canada		June 24, 1914
WALTER, FRANK EDGAR. Mgr., Hall & Co., South Bend, Wash.		Oct. 7, 1914
WEBER, DANIEL RISHEL. Asst. Supt., Grant Smith & Co. & McDonnell, Ltd., Box 383, Monroe, Wash.	Jun.	Mar. 1, 1910
	Assoc. M.	Oct. 7, 1914
WEIDMAN, JOHN HYND. Civ. Engr. and Contr., 209 Union Bldg., Syracuse, N. Y.		Sept. 2, 1914

## ASSOCIATES

MARTIN, JAMES. Supt., Drum Power Div. and Constr. Dept., Pacific Gas & Elec. Co., Colfax, Cal.	Sept. 2, 1914
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## 674 MEMBERSHIP—ADDITIONS—CHANGES OF ADDRESS [Society Affairs.

ASSOCIATES (Continued)		Date of Membership.
OSBORNE, CLARENCE BRISTOL. Chf. Geologist, California Highway Comm., Forum Bldg., Sacramento, Cal....	Oct. 7, 1914	
SMITH, WILLARD ADELBERT. Pres. and Editor, <i>The Railway Review</i> , 1407 Ellsworth Bldg., Chicago, Ill.....	Sept. 2, 1914	
STARRETT, WILLIAM AIKEN. Archt. (Starrett & Van Vleck), 45 East 17th St., New York City.....	Oct. 7, 1914	

## JUNIORS

ALEXANDER, ALBERT MANGUM. 912 Faxon Ave., Memphis, Tenn.....	Sept. 2, 1914	
BANCK, WILLIAM HERBERT DOUGHTY. P. O. Box 579, Wilmington, N. C.....	June 24, 1914	
FRISSELL, NELSON EMMONS. Asst. Engr., State Board of Health, 166 West Hanover St., Trenton, N. J.....	Oct. 7, 1914	
FROST, EDWARD MURRAY. Engr. with The J. W. Frazier Co., 1223 Illuminating Bldg., Cleveland, Ohio.....	June 24, 1914	
GRAY, EARLE PIERCE. 218 McGraw Ave., Detroit, Mich....	June 24, 1914	
GROVES, WALTER CLYDE. Box 513, Freeport, Pa.....	Oct. 7, 1914	
HOSSACK, ARCHIBALD BABCOCK. Solicitor, The American Appraisal Co., 55 Liberty St., Room 1308, New York City.....	Oct. 7, 1914	
KOCH, OTTO HERMAN SIEGFRIED. With Gustav Lindenthal, 68 William St., New York City.....	Oct. 7, 1914	
KWAUK, BANG. 635 Oakwood Boulevard, Chicago, Ill....	Oct. 7, 1914	
NOLAN, QUINCES ROBERTUS. Supt. of Constr., Park A. Dallas Co., McDonough, Ga.....	May 6, 1914	
PEARSON, HARRY BROWNLEY, JR. Box 192, Akron, Ind....	Oct. 7, 1914	
SMITH, EARL AUDIE. U. S. Engr. Office, Box 72, Louisville, Ky.....	June 24, 1914	
TALBOT, KENNETH HAMMET. Asst. Inspecting Engr., Universal Portland Cement Co., 522 Frick Bldg., Pittsburgh, Pa.....	Oct. 7, 1914	
UNGER, WILLIAM LOUIS. Eng. Draftsman, Public Service Comm., First Dist., 224 Johnson Ave., Richmond Hill, N. Y.....	Oct. 7, 1914	
WALKER, ROBERT YULE. Chf. Engr., Quanah, Seymour, Dublin & Rockport Ry., Box 347, Belton, Tex.....	May 6, 1914	

## CHANGES OF ADDRESS

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BARBER, WILLIAM DAVIS. Kenwood, Cal.	

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- EVANS, LOUIS HYDE. 1743 Washington Boulevard, Chicago, Ill.
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- GODDARD, WILLIAM BECK, JR. Structural Engr., M. C. R. R., 393 Virginia Park, Detroit, Mich.
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- HERRMANN, FREDERICK CHARLES. Cons. Engr., Spring Val. Water Co., 1104 Merchants Exchange Bldg., San Francisco, Cal.
- HEWINS, GEORGE SANFORD. Chestnut St., Dedham, Mass.
- HOXIE, RICHARD LEVERIDGE. Brig.-Gen., U. S. A. (Retired), 1632 K St., N. W., Washington, D. C.

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- KIMBALL, JOSEPH HARRIS. Cons. Civ., Hydr., and San. Engr., Second Floor, City National Bank Bldg., Dayton, Ohio.
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- PROAL, ARTHUR BREESE, JR. Care, Robins Conveying Belt Co., 13 Park Row, New York City (Res., 30 Edgewood Ave., Nutley, N. J.).
- RAMSEY, JOSEPH, JR. Pres. and Gen. Mgr., The Lorain, Ashland & South. R. R., 610 Broadway, Lorain, Ohio.
- RANDALL, HENRY IRWIN. 2901 Fulton St., Berkeley, Cal.
- REABURN, DE WITT LEE. Care, Alaskan Eng. Comm., 1107 Alaska Bldg., Seattle, Wash.
- SHEDD, JOEL HERBERT. Cons. Engr., Highbank, Woonsocket, R. I.
- SMITH, LEONARD CHARLES LINDSAY. Cons. Engr., Queens Plaza Court Bldg. (Res., 59 Woolsey St.), Long Island City, N. Y.
- SOUTHWORTH, EDWARD AUGUSTUS. Territorial Engr., Public Works, Box 1234, Honolulu, Hawaii.
- SUTTON, CHARLES WOOD. 719 Madison St., Chester, Pa.
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- WENTWORTH, CHARLES AUSTIN. Supt., The Foundation Co., Ltd., 148 West Wayne Ave., Wayne, Pa.
- WILSON, CHARLES BEATTY. 2807 Oakland St., Nashville, Tenn.
- WOOTEN, WILLIAM PRESTON. Maj., Corps of Engrs., U. S. A., Washington Barracks, D. C.

## ASSOCIATE MEMBERS

- ALBRIGHT, PORTER HUGH. Cons. Engr., 1306 Baker Detweiler Bldg., Los Angeles, Cal.
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- BALDWIN, FRANCIS NEAL. Asst. Engr., Tex. & Pac. Ry., 6th and Desota Sts., Alexandria, La.
- BARNARD, ELMER ELLSWORTH. Engr. of Roadways, Lynchburg Traction & Light Co. and Roanoke Ry. & Elec. Co., Lynchburg, Va.
- BEE, CHARLES EVERETT. 3 City Hall, Ithaca, N. Y.



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- BERNHARD, JOHANNES HELENUS. 244 West 104th St., New York City.
- BILYU, CHARLES SMITH. New York Representative, Colby & Christie, 50 Church St., New York City.
- BUNDY, OSCAR HAROLD. Chf. of Party, Valuation Dept., So. Ry., Apartment 44, The De Soto, 13th and Massachusetts Ave., N. W., Washington, D. C.
- RUSSE, FRANZ AUGUST. Bridge Engr., L. & N. R. R., No. 7, Central Apartments, 971 South 3d St., Louisville, Ky.
- COOPER, DAVID REGINALD. Hydr. Engr., 2297 Sedgwick Ave., University Heights, New York City.
- DAVIS, ARTHUR ALBERT. Prof. of Civ. Eng., Manhattan Coll., New York City.
- DICKE, EDWARD CHRISTIAN. 502 Merchants-Laclede Bldg., St. Louis, Mo.
- DIXON, GEORGE GALE. Dept. Engr., Dept. of Supply, Akron Improved Water-Works, 618 Fairchild Ave., Kent, Ohio.
- FULLER, CARL HAMILTON. 209 Hardeman Ave., Macon, Ga.
- GANDOLFO, JOSEPH HARRINGTON. Res. Engr., Moody Eng. Co., Care, Behn Bros., San Juan, Porto Rico.
- GREENE, RUSSELL DE COSTA. 316 Flatbush Ave., Brooklyn, N. Y.
- HARMON, WATSON GILBERT. Teaching Asst., Civ. Eng. Dept., Univ. of Michigan, 1217 South State St., Ann Arbor, Mich.
- HARBOD, TOM HIND HUDSON. Care, Georgia R. R., Augusta, Ga.
- HOLMES, FRANK. Care, Thompson-Starrett Co., 51 Wall St., New York City.
- KITTS, JOSEPH ARTHUR. Nevada City, Cal.
- LARKINS, EDGAR ERNEST. Structural Engr., Larkin Co., 1044 Elmwood Ave., Buffalo, N. Y.
- LIGHTFOOT, WILLIAM JOSEPH. U. S. Surv., Dept. of the Interior, Care, U. S. Surveyor-General, San Francisco, Cal.
- MCALLISTER, DANIEL HANDLEY. Care, Agricultural Coll. of Utah, Logan, Utah.
- MCWETHY, LE ROY. 217 Humboldt Bank Bldg., San Francisco, Cal.
- MARSHALL, URBAN SERENUS. 2515 T St., Sacramento, Cal.
- MATSON, THOMAS HATCHER. Asst. Field Engr., Interstate Commerce Comm., 731 Wells Fargo Bldg., San Francisco, Cal.
- MOORE, ARTHUR ROLAND. 137 Waverly St., Buffalo, N. Y.
- MOOREHEAD, THEODORE PARKER. Vice-Pres., H. L. Stevens & Co., 1109 Karpen Bldg., Chicago, Ill.
- NEWHALL, WILLIAM BARRETT. Cons. Engr., 2702 Humboldt Ave., South, Minneapolis, Minn.
- PARSONS, AUGUSTUS TABER. Care, *Western Engineering*, 420 Market St., San Francisco, Cal.
- PEARSE, WILLIAM WORTH. 125 Robert St., Toronto, Ont., Canada.
- PECK, MYRON HALL. Care, North American Dredging Co., 414 Thirteenth St., Oakland, Cal.
- PETERSON, OTTO WALLACE. 564 Forest St., Oakland, Cal.

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- POE, HARRY TINKER, JR. U. S. Dept. of Agriculture, Office of Markets and Rural Organization, Washington, D. C.
- PRENTICE, WILLIAM HENDRY, JR. Care, Richard Morey, 515 Jackson St., Waco, Tex.
- RANDALL, FRANK ALFRED. Civ. and Structural Engr. (Randall & Warner), 79 West Monroe St., Room 511, Chicago, Ill.
- RAPALJE, HERBERT DEWITT. Cons. Engr., Room 511, Southern Bldg., Wilmington, N. C.
- RUGGLES, ARTHUR VALENTINE. Asst. Engr., Filtration Comm., Filtration Plant, West 45th St. and Division Ave., Cleveland, Ohio.
- SAWTELLE, HARRY FRANCIS. With Fay, Spofford & Thorndike, 308 Boylston St., Boston, Mass.
- SCHENK, ERNEST EUGENE. Care, Bureau of Public Works, Manila, Philippine Islands.
- STARR, HERBERT HARRIS. Asst. Engr., Erecting Dept., Am. Bridge Co. of New York, 3875 Broadway, New York City.
- STEVENS, PERLEY EGBERT. 1787 Portland Ave., St. Paul, Minn.
- TOPPING, PERRY. Asst. Engr., St. L. & S. F. R. R. (Res., 4014<sup>th</sup> De Touty St.), St. Louis, Mo.
- TROST, ADOLPHUS GUSTAVUS. Structural Engr. (Trost & Trost), P. O. Box 271, El Paso, Tex.
- VOLCK, ADALBERT GEORGE. Care, Munroe & Co., 4 Rue Ventadour, Paris, France.
- WANZER, JAMES OLIN. 488 Crescent St., Oakland, Cal.
- WHITAKER, RALPH WALLACE. 626 Perry St., Davenport, Iowa.
- WHITSON, ABRAHAM UNDERHILL. Special Agt., Provident Life & Trust Co. of Philadelphia, 164 Montague St., Brooklyn (Res., Flushing), N. Y.

## ASSOCIATES

- FOSTER, CLARENCE MARVIN. Dist. Mgr., The Edison Portland Cement Co., 1027 Commercial Trust Bldg., Philadelphia, Pa.
- Goss, OLIVER PERRY MORTON. Cons. Engr., Assoc. of Creosoting Companies of the Pacific Coast and West Coast Lumber Mfrs.' Assoc., 909 White Bldg., Seattle, Wash.
- KORNFELD, ALFRED EPHRAIM. With *Engineering News*, Tenth Ave. at 36th St. (Res., 114 East 71st St.), New York City.
- LIEBMANN, ALFRED. 755 Park Ave., New York City.
- OLDS, WILLIAM CLARENCE. Industrial Agt., Industrial and Agricultural Dept., So. Ry., 1901 G St., N. W., Washington, D. C.

## JUNIORS

- APPEL, HARRIS ARKUSH. Engr., Carbolineum Wood Preserving Co., 182 Franklin St., New York City.
- BAKER, ALBERT ASA. Civ. Engr., U. S. N., Naval Station, Cavite, Philippine Islands.

JUNIORS (Continued)

- BATTIE, HERBERT SCANDLIN. Res. Engr., Scofield Eng. Co., Box 265, Greensboro, N. C.
- BEALL, PENDLETON. Brookville Rd., Chevy Chase, Md.
- BROWN, GEORGE FRANKLIN. Fredonia, Kans.
- CLARKE, ALFRED HENRY. 208 Winthrop Rd., Brookline, Mass.
- DAVENPORT, ROYAL WILLIAM. Asst. Engr., Water Resources Branch, U. S. Geological Survey, Washington, D. C.
- EDWARDS, GEORGE RAY. Asst. Engr., International Contract Co., 856 East 56th St., Seattle, Wash.
- HALL, CHARLES LACEY. First Lieut., Corps of Engrs., U. S. A., Care, Chf. of Engrs., Washington, D. C.
- HASWELL, JOHN ROBERT. Drainage Engr., U. S. Dept. of Agriculture, 319 Custom House, Baltimore, Md.
- ILLINGWORTH, GEORGE CORLISS. Sales Mgr., Murphy Iron Works, 603 Union Trust Bldg., Cincinnati, Ohio.
- JONES, CHARLES HYLAND. Superv., Erie R. R., Susquehanna, Pa.
- KNISKERN, LEWIS THAYER. Care, Thompson-Starrett Co., 51 Wall St., New York City.
- MCCLURE, HUNTER. 34 Highland Ave., Piedmont, Cal.
- MORRISON, WILLIAM HARRISON, JR. 650 Tenth St., Brooklyn, N. Y.
- PARTRIDGE, JOHN FREDERICK. 806 Kohl Bldg., San Francisco, Cal.
- PERRY, LYNN ELWOOD. 318 Halliday Estate Bldg., Cairo, Ill.
- PIPER, HARRY PAUL, JR. P. O. Box 66, Succasunna, N. J.
- RAKESTRAW, CHARLES LYSANDER. Care, U. S. War Dept., Vernalis, Cal.
- REUKAUF, WILLIAM CHRISTIAN. Engr. with Walter Kidde, 140 Cedar St., New York City.
- RICHARDS, ARTHUR. 656 South Webb Ave., Alliance, Ohio.
- SCHEDLER, CARL WILLIAM, JR. Elm Rock Rd., Bronxville, N. Y.
- SELMER, WILLIAM LEE. Asst. Engr., Public Service Comm. of New York City, 30 East 128th St., New York City.
- STAVA, WILLIAM. Asst. Engr., South San Joaquin Irrig. Dist., 1318 Humboldt Bank Bldg., San Francisco, Cal.
- SWINTON, ROY STANLEY. Care, Lincoln Memorial Comm., 1729 New York Ave., Washington, D. C.
- WITTSTEIN, HERMAN LEWIS. Care, Knox Motors Co., Springfield, Mass.

DEATHS

- CRAWFORD, WILLIAM. Elected Member, November 7th, 1888; died January 27th, 1913.
- GREEN, BERNARD RICHARDSON. Elected Member, October 2d, 1889; died October 22d, 1914.
- RICKON, FREDERIC JOHN HENRY. Elected Member, January 4th, 1888; died October 7th, 1914.

Total Membership of the Society, November 5th, 1914;

7 641.

# MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(October 6th to November 2d, 1914)

NOTE.—This list is published for the purpose of placing before the members of this Society, the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.

## LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

- (1) *Journal*, Assoc. Eng. Soc., Boston, Mass., 30c.
- (2) *Proceedings*, Engrs. Club of Phila., Philadelphia, Pa.
- (3) *Journal*, Franklin Inst., Philadelphia, Pa., 50c.
- (4) *Journal*, Western Soc. of Engrs., Chicago, Ill., 50c.
- (5) *Transactions*, Can. Soc. C. E., Montreal, Que., Canada.
- (6) *School of Mines Quarterly*, Columbia Univ., New York City, 50c.
- (7) *Gesundheits Ingenieur*, München, Germany.
- (8) *Stevens Institute Indicator*, Hoboken, N. J., 50c.
- (9) *Engineering Magazine*, New York City, 25c.
- (11) *Engineering* (London), W. H. Wiley, 432 Fourth Ave., New York City, 25c.
- (12) *The Engineer* (London), International News Co., New York City, 35c.
- (13) *Engineering News*, New York City, 15c.
- (14) *Engineering Record*, New York City, 10c.
- (15) *Railway Age Gazette*, New York City, 15c.
- (16) *Engineering and Mining Journal*, New York City, 15c.
- (17) *Electric Railway Journal*, New York City, 10c.
- (18) *Railway Review*, Chicago, Ill., 15c.
- (19) *Scientific American Supplement*, New York City, 10c.
- (20) *Iron Age*, New York City, 20c.
- (21) *Railway Engineer*, London, England, 1s. 2d.
- (22) *Iron and Coal Trades Review*, London, England, 6d.
- (23) *Railway Gazette*, London, England, 6d.
- (24) *American Gas Light Journal*, New York City, 10c.
- (25) *Railway Age Gazette*, Mechanical Edition, New York City, 20c.
- (26) *Electrical Review*, London, England, 4d.
- (27) *Electrical World*, New York City, 10c.
- (28) *Journal*, New England Water-Works Assoc., Boston, Mass., \$1.
- (29) *Journal*, Royal Society of Arts, London, England, 6d.
- (30) *Annales des Travaux Publics de Belgique*, Brussels, Belgium, 4 fr.
- (31) *Annales de l'Assoc. des Ing. Sortis des Ecoles Spéciales de Gand*, Brussels, Belgium, 4 fr.
- (32) *Mémoires et Compte Rendu des Travaux*, Soc. Ing. Civ. de France, Paris, France.
- (33) *Le Génie Civil*, Paris, France, 1 fr.
- (34) *Portefeuille Economiques des Machines*, Paris, France.
- (35) *Nouvelles Annales de la Construction*, Paris, France.
- (36) *Cornell Civil Engineer*, Ithaca, N. Y.
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**Bridges—(Continued).**

- Wooden Cantilever Traveler, Equipment Employed in Erecting Judith River Plate-Girder Railroad Viaduct at Lewiston, Montana.\* (14) Oct. 10.  
 True Pressure Line in a Masonry Arch.\* Walter M. Smith. (14) Oct. 10.  
 Quebec Bridge Anchor Arm Diagonal and Posts.\* (14) Oct. 10.  
 Protecting Steelwork against Locomotive Blasts.\* (13) Oct. 15.  
 Self-Supporting Concrete Arch Reinforcement of Structural Shapes.\* (14) Oct. 17.  
 General Specifications for Bridge Work of Illinois State Highway Commission.\* (86) Oct. 21.  
 The Spokane River and Hangman Creek Viaduct of the O. W. R. R. & N. Co.\* J. A. Baar. (13) Oct. 22.  
 Reinforcing the Winona Bridge, C. & N. W. Ry.\* (13) Oct. 22.  
 Reinforced Concrete Bridges.\* (Report of Committee, Am. Ry. Bridge and Bldg. Assoc.) (15) Oct. 23; (18) Oct. 31.  
 Bridge over Lower Ganges River in India.\* Frederick C. Coleman. (14) Oct. 24.  
 Chicago, Burlington & Quincy Concrete Pile Trestles.\* (14) Oct. 24.  
 Erecting Long Girders with a Gallows Bent in Kansas City.\* (14) Oct. 24.  
 A Noteworthy Steel Trestle, Stock-Pile Trestle at Negaunee Mine.\* (13) Oct. 29.  
 Don Section, Bloor Street Viaduct, Toronto.\* (96) Oct. 29.  
 Cantilever Bridge Built to Resemble Concrete Arch.\* (14) Oct. 31.  
 Die Wiederherstellung der Puppenbrücke in Lübeck mittels des Gewölbe-Expansions-Verfahrens (Patent Buchheim & Heister.)\* R. Färber. (51) Sup. 18.  
 Fachwerkträger mit Weiter Ausfachung.\* J. Melan. (69) Aug.  
 Die Berücksichtigung der Formänderungen bei der Berechnung der Hängebrücke mit Fundament-Verankerung. Karl Hoening. (69) Aug.  
 Alte und neue eiserne Brücken des Oder-Spree-Kanals.\* Ahlefeld. (40) Aug. 29.

**Electrical.**

- The Future Progress of Cable Telegraphy.\* H. W. Malcolm. (73) Serial beginning Sept. 25.  
 Experiments with Furnace Electrodes.\* F. A. J. Fitzgerald and A. T. Hinckley. (Abstract of paper read before the Am. Electrochemical Soc.) (73) Sept. 25.  
 The Storm Detector and Its Influence Upon the Operation of Lighting Central Stations.\* W. H. Lawrence. (From the *General Elec. Review*.) (73) Oct. 2.  
 Effect of Wave Form on the Readings of Moving Iron Instruments.\* R. B. Burrows. (73) Oct. 2.  
 Economics of the Electric-Motor Drive. H. F. Stratton. (Abstract of paper read before the American Foundrymen's Assoc.) (22) Oct. 2.  
 Large Induction Motors: Some Features of Mechanical Design.\* G. Moores. (26) Serial beginning Oct. 2.  
 Mr. Robt. W. Paul's Electrical Instrument Works at New Southgate.\* (26) Oct. 9.  
 Report on Seattle Municipal (Lighting) System. (27) Oct. 10.  
 Rebuilding a Double-Decked Generating Station.\* (27) Oct. 10.  
 Arc Lamp Photometry.\* Ford W. Harris. (111) Oct. 10.  
 Notes on Commutation. B. G. Lamme. (Abstract of paper read before the Assoc. of Iron and Steel Elec. Engrs.) (64) Oct. 13.  
 Combination Electric and Ice Plant, Kentucky Traction and Terminal Co.\* Warren O. Rogers. (64) Oct. 13.  
 Transmission Line Characteristics.\* E. Maerker. (96) Oct. 15.  
 Power for Electric Furnace Work. W. S. Horry. (Paper read before the Am. Electrochemical Soc.) (73) Oct. 16.  
 Calculation of the Magnetising Current of Three-Phase Induction Motors. S. Parker Smith and W. H. Barling. (73) Oct. 16.  
 Sources of Direct Current for Electrochemical Processes. F. D. Newbury. (Abstract of paper read before the Am. Electrochemical Soc.) (73) Oct. 16.  
 Eddy Current Losses in Sheet Steel as a Function of the Resistivity. J. D. Ball and W. E. Ruder. (From the *General Electric Review*.) (73) Oct. 16.  
 Off-Peak Loads and the Electric Furnace. Woolsey McA. Johnson. (27) Oct. 17.  
 Electrical Operation Economical for Fertilizer Industry.\* C. E. Rose. (27) Oct. 17.  
 Radio-telegraphy at the Eiffel Tower.\* John L. Hogan, Jr. (46) Oct. 17.  
 A Résumé and Comparison of Rate Theories.\* Stacy Hamilton. (Paper read before the N. W. Elec. Light and Power Assoc.) (111) Oct. 17.  
 Concrete Posts. (Report of Committee, Am. Ry. Bridge and Bldg. Assoc.) (15) Oct. 23.  
 The Electrical Resistance of Nickel in Magnetic Fields.\* W. Morris Jones and J. E. Malam. (Abstract from the *Philosophical Magazine*.) (73) Oct. 23.  
 The Balsillie System of Wireless Telegraphy as Employed in the Radiotelegraph Stations of the Commonwealth of Australia.\* J. G. Balsillie. (Paper read before the British Assoc.) (73) Oct. 23.  
 Power for Karpen Factory.\* Thomas Wilson. (64) Oct. 27.  
 The Goldschmidt Transatlantic Radio Station.\* John L. Hogan, Jr. (27) Oct. 31.  
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 The Collin-Jeanne System of Wireless Telephony.\* Jacques Boyer. (46) Oct. 31.  
 Electric Shovels in Lapland.\* L. E. Ives. (16) Oct. 31.

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- Das Marmorlicht und seine Bedeutung für die Beleuchtung von Krankenhäusern.\* W. Voegel. (7) July 25.  
 Elektrische Tastensperren und Gleichstromblockfelder.\* Becker. (102) Aug. 1.  
 Neueinrichtung der Streckenbeleuchtung am Kaiser-Wilhelm-Kanal.\* Prietze. (40) Aug. 1.  
 Ueber die Halbwattlampe.\* Marcello v. Pirani. (40) Aug. 8.  
 Elektrische Fernmess- und Fernstellvorrichtungen. Richard Schwenn. (7) Sept. 19.  
 Gleichstrom-Amperestundenzähler als Ersatz für Wattstundenzähler. W. Strelow. (41) Sept. 24.  
 Zur quantitativen Berechnung von Drehstrommotoren mit Kollektor in Serienschaltung.\* F. v. Kleist. (41) Oct. 8.  
 Ueber die Prüfung von Starkstromkabeln im Werk und nach der Verlegung unter besonderer Berücksichtigung des hochgespannten Gleichstromes.\* Leon Lichtenstein. (41) Serial beginning Oct. 8.  
 Untersuchungen von Kamerlingh-Onnes über das Verhalten des elektrischen Widerstandes von Metallen bei niederen Temperaturen.\* L. Schüler. (41) Oct. 8.

**Marine.**

- Note on the Foster Strainmeter and Some Data Obtained Therewith.\* W. R. G. Whiting. (90) Vol. 56.  
 A Torsionmeter with Visible Scale.\* K. Suyehiro. (90) Vol. 56.  
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 The Stability of Ships in Damaged Condition. P. Y. Brimblecombe. (90) Vol. 56.  
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 Final Report of Work Done in Connection with the Post-Graduate Research Scholarship in Naval Architecture. A. Cannon. (90) Vol. 56.  
 The New Niclausse High-Duty Marine Type Boiler.\* Jules Niclausse. (75) July.  
 Development of Internal Combustion Engines for Marine Purposes. M. Drosne. (75) July.  
 The Coaling of Warships.\* F. J. Warden-Stevens. (57) Oct. 2.  
 The French Quadruple-Screw Liner *Lutetia*.\* (11) Serial beginning Oct. 2.  
 The Automobile Torpedo.\* (From *La Nature* and *La Science et la Vie*.) (19) Oct. 3.  
 Attack and Defense by Submarine Mines.\* (46) Oct. 3.  
 The Submarine Vindicated.\* (46) Oct. 3.  
 Coaling at Las Palmas.\* (57) Oct. 9.  
 The Motor Ship *Arum*.\* (19) Oct. 17.  
 Coal-Handling Plant on the United States Fleet Collier *Jupiter*.\* (11) Oct. 23.  
 The Big Atlantic Liners.\* (19) Oct. 24.  
 Capital Ships of the Future: Admiral Sir Percy Scott's Views. (From *Journal of the Royal United Service Institution*.) (44) Nov.

**Mechanical.**

- The Elasticity and Endurance of Steam Pipes.\* C. E. Stromeyer. (90) Vol. 56.  
 Report of the Committee (Institution of Civil Engrs.) on Tabulating the Results of Steam-Engine and Boiler Trials, 1913.\* (63) Vol. 195.

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**Mechanical—(Continued).**

- The Development of the Sugar Industry.\* C. A. Browne. (6) Apr.  
 Air in Jet Condensers.\* C. L. W. Trinks. (58) June.  
 Balancing of Internal-Combustion Engines.\* H. F. Fullagar. (75) July.  
 Pulverized Coal for Steam Making.\* F. R. Low. (55) Oct.  
 An Installation for Powdered Coal Fuel in Industrial Furnaces.\* William Dalton and W. S. Quigley. (55) Oct.  
 The Recovery of Gas Works By-Products.\* C. C. Tutwiler. (3) Oct.  
 Pulverized Coal Burning in the Cement Industry.\* R. C. Carpenter. (55) Oct.  
 Elements of Bearing Design and Lubrication.\* William Foote. (From *Electric Journal*.) (108) Oct.  
 Sand Blast for Machine Shop and Foundry.\* H. D. Gates. (108) Oct.  
 Slide Valves.\* James Andrews. (Paper read before the Scientific Soc. of the Glasgow Royal Technical Coll.) (47) Serial beginning Oct. 2.  
 Recent Improvements in Gas Manufacture. Alfred E. Forstall. (66) Oct. 6.  
 Some Data on the Use of Slings in Handling Loads.\* (86) Oct. 7.  
 Operating and Testing Electric Pyrometers.\* Walter A. Behrens. (72) Oct. 8.  
 Williams Drop Forging Plant at Buffalo.\* (20) Oct. 8.  
 The New Gary 36-Inch Slabbing Mill.\* (20) Oct. 8.  
 Preventing Piping in Steel Castings. John Howe Hall. (Paper read before the Am. Foundrymen's Assoc.) (20) Oct. 8.  
 A Pressing, Drawing and Stamping Works in Shropshire.\* (12) Oct. 9.  
 The Alley and Maclellan Air Compressors.\* (12) Oct. 9.  
 Modern Practice in Die Casting. Charles Pack. (Paper read before the Am. Inst. of Metals.) (47) Oct. 9.  
 The Electric Furnace in the Foundry. W. L. Morrison. (Abstract of paper read before the Am. Foundrymen's Assoc.) (47) Oct. 9.  
 High-Speed Flooring and Match-Boarding Machine.\* (11) Oct. 9.  
 The Parseval Airship Used by the German Army.\* Carl Dienstbach. (19) Oct. 10.  
 Steam as a By-Product of Internal Combustion Engines.\* J. B. Meriam. (62) Oct. 12.  
 Liquid Gas.\* Nisbet Latta. (24) Serial beginning Oct. 12.  
 Illinois Standards of Service for Gas and Electric Utilities. S. P. Farwell. (24) Oct. 12.  
 Notes on the Design of Gas Condensers. J. S. Hang. (Paper read before the Canadian Gas Assoc.) (24) Oct. 12.  
 The Wholesale Distribution and Measurement of Gas. J. D. Hackstaff. (Paper read before the Pacific Coast Gas Assoc.) (24) Oct. 12.  
 Boiler Feed Piping. (64) Oct. 13.  
 An Electrical Process for Detarring Gas.\* F. W. Steer. (Paper read before the Am. Gas Inst.) (83) Oct. 15.  
 Abrasives. Clarence Hawke. (Paper read before the Am. Foundrymen's Assoc.) (47) Oct. 16.  
 Installation, Repairing and Testing of Meters. Chas. Otten, Jr. (83) Oct. 15.  
 Malleable Iron, Its Manufacture, Characteristics, and Uses. J. P. Pero. (Paper read before the Am. Foundrymen's Assoc.) (47) Oct. 16.  
 New Hangars for Military Uses.\* (19) Oct. 17.  
 Standardization of Steel Foundry Practice.\* Dudley Shoemaker. (Paper read before the Am. Foundrymen's Assoc.) (62) Oct. 19.  
 Producer Gas Efficiency.\* (76) Oct. 20.  
 Gas Fired Steam Boilers.\* H. E. G. Watson. (Paper read before the Canadian Gas Assoc.) (24) Oct. 19.  
 Standard Methods of Gas Testing. C. W. Hinman. (24) Oct. 19.  
 A New Standard Light Source.\* L. A. Jones. (Paper read before the Illuminating Eng. Soc.) (24) Oct. 19.  
 Gas-Exhausters. C. H. Kranshaar. (Paper read before the Scottish Junior Gas Assoc.) (66) Oct. 20.  
 Oil Tar Separation, Recovery, and Disposal. R. E. Wyant. (Paper read before the Am. Gas Inst.) (66) Oct. 20.  
 Tests of Substitutes for Gasoline.\* J. A. Moyer. (64) Oct. 20.  
 Freeing the Final Stages of Steam Turbines.\* F. R. Low. (64) Oct. 20.  
 Special Machines Used in Manufacturing Pearl Buttons.\* Ethan Viall. (72) Oct. 22.  
 Electric Drive for Lathes.\* C. E. Clewell. (72) Oct. 22.  
 Foundry Cranes and Power Agencies.\* Joseph Horner. (11) Serial beginning Oct. 23.  
 Coal-Dust Reverberatory Firing.\* E. P. Mathewson. (16) Oct. 24.  
 Standards for Gas Service in the West.\* R. S. McBride. (111) Serial beginning Oct. 24.  
 The Practical Method of Handling Locomotive Smoke as Worked Out in Chicago. J. H. Lewis. (Paper read before the Inter. Assoc. for the Prevention of Smoke.) (62) Oct. 26.  
 The Effect of Compression.\* Robert C. H. Heck. (64) Oct. 27.

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- Condenser and Heater Calculations.\* Frank R. Wheeler. (64) Oct. 27.  
 Motor Vehicles and Transportation in the European War.\* Rollin W. Hutchinson, Jr. (9) Nov.  
 Low-Pressure Electric-Welding Machines.\* V. D. Green. (9) Nov.  
 Coke Making in By-Product Ovens. Edmund W. Parker. (83) Nov. 2.  
 Recovering Residuals by the Feld Process.\* F. H. Wagner. (Paper read before the Am. Gas Inst.) (83) Nov. 2.  
 Utilization of Gas Appliances.\* W. J. Serrill. (Paper read before the Am. Gas Inst.) (83) Nov. 2.  
 Erhöhte Ausnutzung kommunaler Maschinenbetriebe durch Verwertung ihrer Abwärme, unter besonderer Berücksichtigung der Dieselmotor.\* Reinh. Saupe. (7) July 25.  
 Eine Kabelbahn.\* W. L. Andree. (69) Aug.  
 Krane für Werkstätten und Fabrikhöfe.\* (52) Aug.  
 Die Modellwerkstätten und das Modellager der Firma Gebrüder Sulzer A.-G. in Winterthur.\* Werner Ahrens. (50) Sept. 24.  
 Gussguss, eine technisch-wirtschaftliche Betrachtung.\* Jacob Leber. (50) Sept. 24.  
 Die Kugellager und ihre Verwendung im Maschinenbau.\* (107) Sept. 26.  
 Verdrängtes Volumen und Walzarbeit.\* (50) Serial beginning Oct. 1.  
 Die Zentrifugalpumpen in der Gruppe 32 der Schweiz, Landesausstellung Bern 1914.\* Franz Präsil. (107) Oct. 3.  
 Neue Versuche über die Unterkühlung beim Ausfluss gesättigten Dampfes. A. Stodola. (107) Oct. 10.

**Metallurgical.**

- Sanitation and Safety First Applied to the Brass Industry.\* F. Moerl. (20) Oct. 1.  
 Experimental Development of the Hall Process. H. F. Wierum. (103) Oct. 3.  
 Steam Stamps from the Gold Miner's Point of View.\* Algernon Del Mar. (103) Oct. 3.  
 Iron and Its Properties. Percy F. Blackwood. (Paper read before the Am. Foundrymen's Assoc.) (47) Serial beginning Oct. 9.  
 Operation of the Oliver Filter in the Globe Mill.\* H. A. Morrison and H. G. Thomson. (103) Oct. 10.  
 Electric Steel Direct from Ore Fines.\* A. C. Dalton. (20) Oct. 15.  
 Development of Continuous Current Decantation.\* Herbert A. Megraw. (16) Serial beginning Oct. 17.  
 Titanium Ores in the Blast Furnace.\* Edwin F. Cone. (20) Oct. 22.  
 Electric Brass Melting. G. H. Clamer and Carl Hering. (Abstract of paper read before the Am. Inst. of Metals.) (26) Oct. 23.  
 The Power Problem in the Electrolytic Deposition of Metals. Lawrence Addicks. (Paper read before the Am. Electrochemical Soc.) (73) Oct. 23.  
 The Power Problem in the Electrolytic Deposition of Metals. H. E. Longwell. (Abstract of paper read before the Am. Electrochemical Soc.) (73) Oct. 23.  
 The Function of Lead Salts in Cyanidation.\* G. H. Clevenger. (103) Oct. 24.  
 Cyanidation at Shafter, Texas.\* (103) Oct. 24.  
 The Uwarra Mill, Candor, N. C.\* Percy E. Barbour. (16) Oct. 24.  
 Birmingham Furnace Practice Development. M. P. Gentry Hillman. (20) Oct. 29.  
 The Turbo-Blower for the Blast Furnace.\* F. G. Cutler. (Paper read before the Am. Iron and Steel Inst.) (20) Oct. 29.  
 A New Process of Metal Coating.\* (13) Oct. 29.  
 Möllerberechnung und Schlackenkonstitution. Bernhard Osann. (50) Sept. 3.  
 Hochofengas zur Beheizung der Koksöfen.\* Oskar Simmersbach. (50) Serial beginning Sept. 17.  
 Die Berechnung von Winderhitzern auf Grundlage der Wind- und Gasgeschwindigkeit.\* Bernhard Osann. (50) Oct. 8.

**Military.**

- Field Fortifications Based on Practical Experiences of the Russia-Japanese War.\* Charles Burnett. (From *Journal of the United States Cavalry Assoc.*) (100) Sept.  
 Protection for the Fighting Line of an Army.\* Leon S. Roudiez. (46) Oct. 3.  
 Mobile Siege Guns in the Present War.\* (46) Oct. 3.  
 The Turret Fort; a Description of the Famous Gruson Armored Turret Used in European Fortifications.\* A. G. Piorkowski. (46) Oct. 3.  
 A 75-Ton Derrick for Defense Erection at Manila.\* (14) Oct. 10.  
 Heavy Siege Guns.\* (12) Oct. 23.  
 Artillerie de Campagne Française et Allemande, le Canon français de 75 et le Canon allemand de 77.\* A. Dumas. (33) Sept. 19.  
 La Fabrication de l'Hydrogène pour le Gonflement des Ballons Militaires, en France et en Allemagne.\* A. Bidault des Chauxes. (33) Sept. 26.  
 Der Eisenbeton in Kriegsbau.\* P. W. Scharroo. (78) Oct. 5.

\*Illustrated.



**Mining.**

- Self-Contained Rescue Apparatus for Use in Irrespirable Atmospheres: Report to the Doncaster Coal-Owners (Gob-Fire Research) Committee. J. S. Haldane. (106) Vol. 47, Pt. 6.
- Mining as a Profession. Hennen Jennings. (6) July.
- Development of Explosive for Our Demolition Equipment.\* W. G. Caples. (100) Sept.
- The Future of Mining in China. Kimio Nishizawa. (29) Sept. 18.
- Coal Mining in Australia.\* (22) Sept. 25.
- New Breaking, Screening and Washing Plant at Pantyffynnon Colliery.\* (22) Sept. 25.
- Concrete Pit Props and Beams.\* (57) Oct. 2.
- Building a Placer Mining Dredge with Electric Power Plant in Portugal.\* H. G. Peake. (103) Oct. 3.
- The Economic Justification for the Use of Electric Power in Collieries. Roslyn Holiday. (Paper read before the Assoc. of Min. Elec. Engrs.) (22) Oct. 9.
- Pit Cages from Rolled Sections.\* (57) Oct. 9.
- Use of Electricity at Penn and Republic Mines.\* Wm. Kelley and F. H. Armstrong. (Paper read before the Lake Superior Min. Inst.) (82) Serial beginning Oct. 10.
- Study of Hoisting Costs in a Small Mine. H. S. Knowlton. (16) Oct. 10.
- A Means of Securing Main Haulage Roads and Return Airways of a Mine Otherwise than with Timber.\* Cymro. (From the *Journal of the Monmouthshire Colliery Officials' Assoc.*) (57) Oct. 16.
- An Account of Some Attempts to Improve Rescue Apparatus. Joseph Parker. (Paper read before the National Assoc. of Colliery Managers.) (22) Oct. 16.
- Mining Methods on the Marquette Range.\* H. T. Hulst, G. R. Jackson, and W. A. Siebenthal. (Report of Committee of the Lake Superior Min. Engrs.) (103) Oct. 17.
- A Review of Recent Progress in Japanese Mines.\* C. A. Tupper. (82) Oct. 17.
- Modern American Rock Drills. L. O. Kellogg. (16) Serial beginning Oct. 17.
- Driving the Sheep Creek Tunnel.\* (16) Oct. 17.
- Explosives.\* William Macnab. (From *Nature*.) (19) Oct. 17.
- Developments at Gwann-Cae-Gurwen Colliery.\* (22) Oct. 23.
- A New Core Remover for Diamond Drilling.\* (82) Oct. 31.
- Follow-Up Drill and Detachable Bit.\* (16) Oct. 31.
- Concrete "Lumber" for Mine Shafts.\* (14) Oct. 31.

**Miscellaneous.**

- The Depreciation of Public Utility Properties As Affecting Their Valuation and Fair Return. John W. Alvord, M. Am. Soc. C. E. (54) Vol. 77.
- A Study of Fluid Resistance.\* Luther Wagoner, M. Am. Soc. C. E. (54) Vol. 77.
- Address at the Annual Convention, Am. Soc. C. E., in Baltimore, Md., June 2d, 1914. Hunter McDonald, President, Am. Soc. C. E. (54) Vol. 77.
- The Philosophy of Engineering. Maurice G. Parsons, Jun. Am. Soc. C. E. (54) Vol. 77.
- Some Aspects of Industrial Chemistry. Leo H. Baekeland. (6) July.
- Lighthouses for Aerial Navigation.\* (19) Sept. 12.
- Recent Developments in the Art of Illumination.\* Preston S. Millar. (3) Oct.
- The Quality of the Twenty-Four-Inch Objective of the Sproul Telescope as Determined by Hartmann Tests.\* John A. Miller and Ross W. Marriott. (3) Oct.
- The Engineer and the Law. William L. Bowman. (36) Oct.
- The South American Field.\* Cyrus T. Brady, Jr. (13) Oct. 15.
- Climatic Influence of Forests. L. A. Fosbery. (Paper read before the Royal Comm. on Forestry.) (19) Oct. 17.
- How Engineers May Best Use Technical Journals. John W. Alvord, M. Am. Soc. C. E. (Paper read before the Federation of Trade Press Assoc.) (96) Oct. 22.

**Municipal.**

- Road Construction and Maintenance: An Informal Discussion Presented at the Meetings of Jan. 17th and 18th, 1913. Am. Soc. C. E. (54) Vol. 77.
- Road Construction and Maintenance: An Informal Discussion Presented at the Meetings of January 23d and 24th, 1914. Am. Soc. C. E. (54) Vol. 77.
- California Practice in Highway Construction.\* W. C. Hammatt, M. Am. Soc. C. E. (54) Vol. 77.
- An Investigation of Sand-Clay Mixtures for Road Surfacing.\* John C. Koch, Assoc. M. Am. Soc. C. E. (54) Vol. 77.
- A Rational Formula for Asphalt Street Surfaces. J. Alden Griffin, Assoc. M. Am. Soc. C. E. (54) Vol. 77.
- The Municipal Works of Cleethorpes.\* Chas. H. Waithman. (Paper read before the Institution of Mun. and County Engrs.) (104) Sept. 25.
- Tarrant County, Texas, Highways. J. C. Travilla. (Paper read before the Engrs' Club of St. Louis.) (1) Oct.
- Traffic Factors. J. Eastwood, Assoc. M. Inst. C. E. (104) Oct. 2.

\*Illustrated.

1919. The following are the names of the members of the American Medical Association who have died during the year 1919.

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**Municipal—(Continued).**

- The Differentiation of Natural and Oil Asphalts. E. C. Pailler. (From the *Journal of Industrial and Engineering Chemistry*.) (86) Oct. 7.
- Bituminous Concrete Using Oyster Shell Aggregate.\* (86) Oct. 7.
- Paving Methods in Baltimore, Maryland.\* Harry D. Williar, Jr. (86) Oct. 7.
- Notes on the Width, Alignment, Grade and Drainage Features of the Designing of Country Roads. Robert A. Meeker. (Paper read before the Canadian Road Congress.) (86) Oct. 7.
- The Control of Openings in Street Pavements and the Cost of Restoration in Cincinnati, O. (86) Oct. 7.
- Pavement Economy. H. B. Pullar. (Paper read before the League of Michigan Municipalities.) (96) Oct. 8.
- Eleven Years' Municipal Work at Hinckley.\* E. H. Crump. (Paper read before the Institution of Mun. and County Engrs.) (104) Serial beginning Oct. 9.
- Voidless Asphalt Macadam Road Construction.\* (104) Oct. 9.
- Private Road over Seven Miles of Marsh and Loose Sand.\* (14) Oct. 10.
- Resurfacing Old Macadam with Bituminous Concrete in Chicago.\* (86) Oct. 14.
- Gravel-Road Construction in Wisconsin.\* (13) Oct. 15.
- Pavement and Roadway Work in Ottawa, Ontario.\* L. McLaren Hunter. (96) Oct. 15.
- Impressions of London's Pavements.\* Henry Welles Durham. (14) Oct. 17.
- The Design and Construction of a Concrete Pavement in the Village of Glencoe, Ill.\* (86) Oct. 21.
- The Prevention of Foundation Movement in Roads.\* E. S. Sinnott. (Abstract of paper read before the Institution of Mun. and County Engrs.) (86) Oct. 21.
- The Relative Value of Different Paving Materials. Geo. W. Tillson. (Paper read before the Cleveland Eng. Soc.) (96) Oct. 22.
- Granite-Block Pavements as Smooth as Asphalt.\* (13) Oct. 22.
- Country Roads in Southeastern Wisconsin, Innovations in State Aid Roads Include Clay-Bound Macadam, High Earth Shoulders on Narrow Roads and Increased Thickness of Concrete.\* (14) Oct. 24.
- The Organization and Standards of the Wisconsin Highway Commission.\* (86) Oct. 25.
- The Traffic Limits of Various Types of Pavements.\* W. de H. Washington. (From Report to the New York State Comm. of Highways.) (86) Oct. 28.
- Snow Disposal Experiments in Manhattan Borough Sewers.\* William Goldsmith. (13) Oct. 29.
- Alternative Forms of Paving Contracts. (14) Oct. 31.
- Tractor Used for Plowing Macadam Highway. (14) Oct. 31.
- Dustless Granite Block Pavement at Lawrence. (14) Oct. 31.
- Spielplätze und Parks in nordamerikanischen Städten. (39) Serial beginning July 20.
- Die gemischte Befestigungsart der Strassen, insbesondere mit Rücksicht auf die Strassenreinigung. Roemer. (39) Sept. 5.

**Railroads.**

- The Transandine Railway.\* Brodie Haldane Henderson. (63) Vol. 195.
- Physical Valuation of Railroads. William J. Wilgus, M. Am. Soc. C. E. (54) Vol. 77.
- Recent Developments of Express Locomotives in France.\* Edouard Sauvage. (75) July.
- Compound Articulated Locomotives. Anatole Mallet. (75) July.
- Signalling on Railway Trains in Motion.\* A. Sartianx, F. Lancrenon, A. Herdner, A. Claveille, L. Marchal, and E. Solacroup. (75) July.
- Timber and Rail Wagons and 11-Ton Open Wagons, Royal Siamese State Railway, Southern Section.\* (21) Oct.
- All-Electric Power Signalling at Immingham Dock, Great Central Railway.\* (21) Oct.
- 2-8-0 Passenger Engine, Queensland Government Railways.\* (21) Oct.
- Steel Rails. Robert W. Hunt. (Paper read before the Engrs' Club. of St. Louis.) (1) Oct.
- Train-Stops on the Chicago & Eastern Illinois R. R.\* (13) Oct. 8.
- Patching Concrete Retaining Walls by a Concrete-Spraying Machine.\* (13) Oct. 8.
- Trainshed of the Kansas City Union Station.\* (13) Oct. 8.
- The Electrification of the Riksgränsen Railway.\* F. Zolland. (Abstract from *Elektrische Kraftbetriebe und Bahnen*.) (73) Oct. 9.
- Direct Railway Communication Between Switzerland and the Riviera. (29) Oct. 9.
- A Study of Some Austrian Locomotive Tests.\* Lawford H. Fry. (From *Forschungsarbeiten aus dem Gebiete des Ingenieurwesens*.) (11) Serial beginning Oct. 9.
- Practical Considerations in the Operation of a Large Terminal Yard. Wm. L. Burt. (15) Oct. 9.
- Lackawanna Pacific Type Freight Locomotive.\* (15) Oct. 9.
- An Improved Mechanical Lubricator for Locomotives.\* (23) Oct. 9.
- Progress Chart for Extension Railroad Improvement.\* J. D. Black. (14) Oct. 10.

\*Illustrated.

Progress Chart for Extension Railroad Improvement. J. D. Black (14) Oct. 10.  
An Improved Mechanical Lubricator for Locomotives. (15) Oct. 9.  
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Practical Considerations in the Operation of a Large Terminal Yard. Wm. L. Burr (15) Oct. 9.

Studies on the Question of the Location of a Large Terminal Yard. Wm. L. Burr (15) Oct. 9.

A Study of Some Australian Locomotive Tests. Lawford H. Fry. (From Transportation Engineering) (15) Serial beginning Oct. 9.

Electric Communication Between Switzerland and the River. (20) Oct. 9.

The Electrification of the Milwaukee Railway. E. Noland. (Abstract) (20) Oct. 9.

Tests on the Chicago & Eastern Illinois R. R. (11) Oct. 9.

Patented Concrete Retaining Walls by a Concrete-Spining Machine. (15) Oct. 9.

Steel Rails. Robert W. Hunt. (Paper read before the House, Club of St. Louis) (1) Oct.

2-3-0 Passenger Engine. Queensland Government Railways. (21) Oct.

Electric Power Signaling at Birmingham Dock. Great Central Railway. (21) Oct.

Timber and Rail Wagon. Royal Wagon Road Railway. (21) Oct.

A Gravelle, L. Marcel, and E. Solignac. (21) Oct.

Signaling on Railway Trains in Motion. A. Rastbach, F. Lammann, A. Heider. (21) Oct.

Compound Articulated Locomotives. Antoine Mallet. (25) July.

Recent Developments of Express Locomotives in France. Edouard Bavaire. (25) July.

Physical Valuation of Railroads. William J. Wiggins. M. Am. Soc. C. E. (24) July.

The Transandinian Railway. Brodie Halldane Henderson. (24) July.

## Railroads.

Die kinematische Bestimmung der Gleisenabstände mit Hölzchen und der Gleisenabstände. Rechner. (30) Sept. 5.

Spitzbügel und Parks in nordamerikanischen Städten. (30) Sept. 5.

Alternative Forms of Paving Contracts. (31) Oct. 31.

Transfer Road for Plover-Machado Highway. (31) Oct. 31.

Frictional Resistance of Locomotives. (31) Oct. 31.

The Organization and Standards of the Wisconsin Highway Commission. (30) Oct. 30.

Thickness of Concrete. (31) Oct. 31.

City-Bound Roads. High Earth Retention on Narrow Road and Increased County Roads in Southern Wisconsin. Innovations in State Aid Road. (31) Oct. 31.

Gravel-Road Pavement as Shown in Asphalt. (31) Oct. 31.

Before the Gravel-Road Pavement. (31) Oct. 31.

The Relative Value of Different Paving Materials. Geo. W. Gilman. (Paper read before the Institution of Men and County Engineers) (30) Oct. 31.

The Provision of Paving Materials in Roads. R. S. Shinnott. (Abstract) (30) Oct. 31.

The Design and Construction of a Concrete Pavement in the Village of Geneva. (30) Oct. 31.

Improvement of London's Pavement. Harry Walter Furman. (14) Oct. 17.

Pavement and Roadway Work in Ottawa. Ontario. J. McArthur Hunter. (20) Oct. 17.

Gravel-Road Construction in Wisconsin. (15) Oct. 15.

Reconstruction of Old Macadam Roads in Wisconsin. (15) Oct. 15.

Private Road over Seven Miles of Marsh and Loose Sand. (15) Oct. 15.

Verbal Asphalt Macadam Road Construction. (15) Oct. 15.

The Institution of Men and County Engineers. (10) Oct. 10.

Eleven Years' Municipal Work at Hingham. E. H. Turner. (Paper read before the Institution of Men and County Engineers) (10) Oct. 10.

Pavement Economy. H. B. Pollak. (Paper read before the League of Michigan Municipalities) (10) Oct. 10.

The Control of Operations in Street Pavements and the Cost of Restoration in Chicago. (10) Oct. 10.

County Roads. Robert A. Mosher. (Paper read before the Canadian Road Notes on the Width, Alignment, Grade and Drainage Features of the Design of the Institution of Men and County Engineers) (10) Oct. 10.

Blindness Caused by Ocular Strabismus. Harry D. Whittier. (10) Oct. 10.

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- The Aesthetic in Grade Separation.\* R. H. Simpson. (14) Oct. 10.  
 Driving the Hoosac Tunnel and the Lessons it Taught. P. B. McDonald. (103) Oct. 10.  
 Union Terminal Construction in Spokane.\* (18) Oct. 10.  
 Southern Railway Improvements Under Way and Authorized.\* (18) Oct. 10.  
 Circuit Requisites for Single Track Automatic Block Signalling.\* G. H. Dryden. (Paper read before the Railway Signal Assoc.) (18) Oct. 10.  
 Maintenance and Transportation Costs. (18) Oct. 10.  
 Block Signals on the Kansas City, Clay County & St. Joseph Railway.\* Robert P. Woods. (17) Oct. 10.  
 The Relation of Geology to Railway-Tunnel Location.\* Edwin C. Eckel. (13) Oct. 15.  
 Analytical Study of Yard Design and Operation.\* J. H. Hopkins. (15) Oct. 16.  
 Effect of the Panama Canal on Coast-to-Coast Traffic. (Testimony before the Interstate Commerce Comm.) (15) Oct. 16.  
 Eight-Wheel Steel Caboose for the Pennsylvania.\* (15) Oct. 16.  
 The New Algoma Central Engine House and Shops.\* (15) Oct. 16.  
 An Interesting Locomotive Conversion.\* (23) Oct. 16.  
 Walschaerts' Valve Gear, London & South-Western Railway.\* (23) Oct. 16.  
 South African Railways. W. W. Hoy. (Annual Report for 1913.) (23) Oct. 16.  
 Arthur's Pass Tunnel in New Zealand. H. Vickerman. (14) Oct. 17.  
 Mooted Principles in Valuation. Frank W. Stevens. (Paper read before the Am. Elec. Ry. Assoc.) (17) Oct. 17.  
 Methods and Instruments Used in Making Precise Surface and Underground Surveys for the Canadian Northern Ry. Tunnel, Montreal, Canada. J. L. Busfield. (86) Oct. 21.  
 Procedure and Progress in Placing Concrete Lining in Burlington Railroad Tunnel at Arminto, Wyo., by Compressed Air Method.\* (86) Oct. 21; (18) Oct. 17; (14) Oct. 31.  
 Wheel Pit and Elevator for Coach-Repair Yard; Michigan Central R. R.\* (13) Oct. 22.  
 Statistical Control of Railway Operation. W. M. Baxter. (Paper read before the Canadian Railway Club.) (96) Oct. 22.  
 Economy in Locomotive Haulage on Steep Gradients.\* A. H. Shield. (12) Oct. 23.  
 The Design of Injector Steam Pipe Connections (for Locomotives).\* Strickland L. Kneass. (15) Oct. 23.  
 The Present Status of Ferro-Titanium in Rail Manufacture.\* (15) Oct. 23.  
 Fatigue of Rails.\* Paul Krenzpointer. (15) Oct. 23.  
 An Efficiency System of Handling Miscellaneous Freight.\* (18) Oct. 24.  
 Breakage of Staybolts in Locomotive Boilers.\* W. L. Turner and B. E. D. Stafford. (18) Oct. 24.  
 Tests of Vanadium Steel Rails. (14) Oct. 24; (18) Oct. 17; (15) Oct. 16.  
 Catenary Experiences on the Empire United Railways, Inc.\* Thomas H. Mather. (17) Oct. 24.  
 Track Crossings on Curves with Superelevation. (13) Oct. 29.  
 A Tunneling Machine for Clay or Stiff Sand Formations.\* (13) Oct. 29.  
 Locomotive Performance on the Chicago Great Western.\* (15) Oct. 30.  
 The New Kansas City, Mo., Union Passenger Station.\* (15) Oct. 30.  
 Versuche über die Bewehrung von Winkelstützmauern.\* W. Schmidt. (51) Sup. 18.  
 Abschnelden der Rauchrohre der Heissdampflokotiven. Uhlmann. (102) Aug. 1.  
 Die Berichtigung verdrückter Gelsbogen.\* Samans. (102) Aug. 1.  
 Das neue Empfangsgebäude auf Bahnhof Bad Homburg vor der Höhe.\* A. Wegner. (40) Aug. 15.  
 Umbau des Bahnhofs Saint-Lazare in Paris.\* Oder. (40) Aug. 15.  
 Zusammensetzbare Winkelstützmauern.\* W. Bäseler. (40) Sept. 5.  
 Die Fahrkante der Schienen, die Hohlkehle der Radreifen und der Bogenwiderstand steifachsiger Eisenbahnwagen. Boedecker. (40) Sept. 5.  
 Die Umwandlung der Nebenbahn Allenstein, Kobbeltbude in eine Hauptbahn.\* Schüler. (40) Sept. 19.  
 Ueber die Elektrisierung der Hauptbahnen. (Abstract from *General Electric Review*.) (41) Sept. 24.  
 Vom Bau der viergleisigen Eisenbahnbrücke über den Neckar und des Rosensteintunnels bei Cannstatt. W. Siegerist. (107) Serial beginning Oct. 10.

**Railroads, Street.**

- Improvements in Motor-Lorries: Self-Loading; Also Driving and Steering Through all Wheels.\* M. Eugene Brille. (75) July.  
 Statical Calculations of Rectangular Reinforced-Concrete Tubes (Subways).\* Otto Gottschalk. (11) Oct. 2.  
 Electric Welding in Track Repairs.\* F. J. Venning. (17) Oct. 10.  
 The Municipal Railways of San Francisco.\* Paul J. Ost. (111) Oct. 10.  
 New Shops and Carhouse of the Atlantic City & Shore Railroad.\* (17) Oct. 10.  
 Report of the Committee on Equipment.\* (Am. Elec. Ry. Eng. Assoc.) (17) Oct. 15.

\*Illustrated.



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- Electric Railways in China. (17) Oct. 15.  
 Report of Committee on Power Generation.\* (Am. Elec. Ry. Eng. Assoc.) (17) Oct. 16.  
 Making a Small Company Pay, the Charlottesville and Albemarle Railway.\* (17) Oct. 17.  
 Adelaide Municipal Tramway Power Plant.\* F. G. Moffitt. (64) Oct. 20.  
 A Method for Constructing a Tunnel under the East River at New York City. Emil Diebitsch. (13) Oct. 22.  
 Twin Cars in Portland, Ore.\* (17) Oct. 24.  
 A Zone System of Fares in Practice.\* R. B. Stearns. (Paper read before the Am. Elec. Ry. Assoc.) (17) Oct. 24.  
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 Cinder Concrete Floors.\* Guy B. Waite, M. Am. Soc. C. E. (54) Vol. 77.  
 Painting Structural Steel: the Present Situation. A. H. Sabin, Assoc. M. Am. Soc. C. E. (54) Vol. 77.  
 Progress Report of the Special Committee on Concrete and Reinforced Concrete.\* (Am. Soc. C. E.) (54) Vol. 77.

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- The Effect of Saturation on the Strength of Concrete.\* J. L. Van Ornum, M. Am. Soc. C. E. (54) Vol. 77.
- Statistical Limitations Upon the Steel Requirement in Reinforced Concrete Flat Slab Floors.\* John R. Nichols, Jun. Am. Soc. C. E. (54) Vol. 77.
- Shearing Strength of Construction Joints in Stems of Reinforced Concrete T-Beams, as Shown by Tests.\* Lewis J. Johnson, M. Am. Soc. C. E., and John R. Nichols, Jun. Am. Soc. C. E. (54) Vol. 77.
- Porosity of Building Stone. D. E. Campbell. (6) Apr.
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- Safe Eccentric Loading of Rivets.\* Joseph Di Stasio. (6) Apr.
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\*Illustrated.